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EDITOR RESARTUS*

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THE FACULTY of communication seems to have become a uniquely exciting phenomenon in recent years, as if the application of electricity to it had somehow changed its basic nature and purposes. Actually the ability to communicate or impart; to make common to all or to share with others those ideas, emotions or sensations that were primarily one's own is not new and has always been among the most important faculties that distinguish the animate from the inanimate. From a purely biologic standpoint even trees and flowers, aided by the bees—a guileless allegory by which the very young are acquainted with the facts of life—engage in communication for the perpetuation of their own peculiar and strongly rooted philosophy of being. Even busy human executives and experts in public relations assemble for the purpose of cross fertilization, whatever that may be, and however accomplished, although it is presumably an exchange of ideas and a mutual sparking of the imaginative processes.

Communication, then, of various sorts, is common to even the lowliest creatures, the word implying the sharing of that which was erstwhile restricted. It applies to the chirping of the cricket and the antics of the whooping crane when it meets its mate; its techniques range in sophistication from those of our canine companions on their daily rounds, to the nose rubbing engaged in during the chance meeting of a brace of earthworms in their subterranean philanderings.

It is with the development and the uses and misuses of human means of communication that we are almost exclusively concerned, however, on this occasion; a development that culminated, despite various pictorial adventures along the way, in the discovery of those winged words that once released go into orbit for better or for worse, but always beyond recall. The published *erratum* may serve as an apology but cannot erase the impression that has been made.

Despite the implication that some sort of battle is in progress between the traditional function of periodical publication and the so-called audio-visual techniques of imparting information, it is obvious that communication has always been both auditory and visual with sometimes a little ancillary assistance from the other senses. To go back a few thousand years it may be assumed that, at the human level, rudimentary sounds gradually developed into speech, crude drawings became generally understandable pictures, and simple geometric symbols grew slowly into an organized alphabet.

For communication at appreciable distances, pillars of cloud by day and of fire by night represented an exalted form of the transmittal of messages, ingeniously simulated by the North American Indians and probably others in their telegraphic systems of smoke signals. The use of the sun's reflected rays in flashing codes from point to distant point suggests that there is little new under the sun, although the Word, as indicated by St. John, was the beginning of all things pertinent to man's mature intelligence.

For the comfort of those of us who believe that the word persists in all its authenticity only when set down where all who wish can view, we have such impressive examples as the engraved tablets of the Sumerians, the chiseled Code of Hammurabi, the Rosetta Stone, the papyruses of Egypt and the Dead Sea scrolls. If we cannot hear the still small voice we can nevertheless read about it. And even today, if one has thoughts that he believes are an improvement on the confusion of Babel, he had better write them down and let time prove their worth.

Any defence of any sort of communication must, of course, be confined to that which meets certain reasonable requirements. For as man has tried to improve his methods he has often perversely succeeded only in making them more elaborate. He has tended to produce, not by a natural attention to the needs of imparting, but by a strange wilfulness, a complexity of jargons and an overextension of wordiness interspersed with a baffling and even arrogant use of abbreviations meaningful only to the sophisticate in that particular highly specialized branch of pedantry. As he has become impressed with the necessity of making some show of shortening his messages if not of purifying his diction, he has fallen into the pit of over-

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abbreviation – of substituting for words, terms, phrases and perhaps sentences cryptic blocks of letters, presumably initials and usually in capitals, to emphasize the importance of what the listener or the reader is so often unable to decode.

In the frustration that results from the attempt to fathom the meaning of a word, a phrase or a set of initials – sometimes hauntingly familiar even if elusive–the thread of the entire text may be lost. To me the title of an ECHO virus calls to mind only a rumbling reverberation in an empty space and I can no longer remember and seem scarcely to care what many other such symbolic aggregations really represent. What has been and perhaps remains a distinguishing feature of the vaunted superiority of man over his so-called dumb relatives–that of verbalization–is in danger of growing into a complicated system of contrived techniques that weary the eye, abuse the ear and insult the intelligence. So much for the constant need of keeping our lines of communication not only intact but reasonably intelligible, having in mind that the auditory and the visual, even in their earliest concepts, can hardly be separated. Before Benjamin Franklin, like a Prometheus in knee breeches, brought fire from the clouds and found a new way of unlocking the secrets of rapid communication with a key tied to a kite string, the spoken and the printed word were co-operating in the dissemination of information.

It has been only with the modern application of electricity to communication in the form of radio broadcasts, tape and disk recordings, moving picture films and closed-circuit television shows of a spectacularly moving nature that any competition with the printed word has seemed to threaten the traditional means by which knowledge is both preserved and promulgated. There is, however, no real conflict between the two systems, for, indeed, the electric techniques are distinguished chiefly by the sheer practicality of the material that lends itself to diffusion by their methods; by the pertinacity of those addicted to its diffusion, and by the endurance of the audience that is subjected to its influence.

The printed literature of medicine remains the indispensable archive of its scientific, clinical, social and economic progress, as well as of its philosophy; the permanent depository of discovery whether in the physical sciences or in the development of ideas. And in order that the record may be legible, the editor, like Samuel Johnson's lexicographer, a harmless drudge, enjoys also a reflected and anonymous indispensability. This can be said even as one gladly concedes the value of the radio in the broadcasting of news, of music, of baseball and of the weather, regardless of the accuracy of its predictions. One must remain convinced, on the other hand, that the relative effort of acquiring not merely casual information and practical instruction but basic knowledge from reading has positive virtues compared with the lecture, the broadcast, the tape recording, the film or the television program, however ingeniously contrived or however costly to produce. It is the difference between being tube-fed and cutting up one's own meat; between going after something that requires mastication or having it piped in like a nutrient enema, if one dared use such a comparison. In either case the substance must be nourishing and the presentation effective.

The electrically transmitted audiovisual message is possibly the easiest way of receiving information and probably the least effective way of ensuring its retention. But so far as substantial communications of any permanent value are concerned, unless they become part of the indelible record they are like the sped arrow or the thistledown launched on the October breeze.

The printed word has two basic virtues in particular. It ensures a relative permanence of the annals of man's achievements in the only satisfactory form, so far, in which the increments to his knowledge can be preserved for future reference, and it provides ready availability as a convenient record that can be laid aside, if necessary, and read or reread at a time of one's own choosing.

The primary need of maintaining for these purposes a continuing output of medical journals if not, indeed, an increasing one–although Heaven protect us from such a contingency–is based on the prodigious growth and changing character of medical research, which has come to have almost an obsessive quality. Medical research, once an inspired avocation–a system that had its points, even if the method has become obsolete–is now an endowed manner of life for many thousands of dedicated and eager scientists, government financed and committed to endless publication in order to justify the means by which their various ends are sought and occasionally achieved.

In view of the quantity of such material clamouring to be preserved in print, the bona fide scientific and specialty journals need be at no loss for lack of content. The electrically transcribed methods of communication, on the other hand, have little part in the recording of this major contribution to medical progress, their legitimate share in the purveying of information being rather that of postgraduate education in the form of reviews, practical instruction in the everyday pursuit of the art of medicine, and the instantaneous reporting in their several tongues of the increasingly popular multilingual conferences.

Nevertheless, to justify its continued existence in view of a considerable competition, if not with other methods of communication, at least with the rest of the several thousand periodicals striving for their share of the available readership, any individual journal must constantly reappraise its own aims and techniques. It must maintain a consistently high level of quality in the selection of

material and the manner of its presentation. Its primary function of publishing mainly the product of original observation or investigation or a mature analysis and summarizing of work already done, should be backed up by some degree of skill in making the material clear to as many readers as possible. No matter how much metal an ore may contain, it must be refined to make it of practical value.

We are usually concerned in this conference with the editing of general or all-purpose medical journals, a business at least as exciting as the preparation of a scientific or a specialty publication, or at least so I assume, knowing nothing about the latter. If the content is not as highly technical as that of a purely scientific periodical, then there is some balm left in Gilead for the average reader, and the substance that is offered him rests on a broader base and covers a wider area than is the case with the more esoteric publications. Its selection, in addition, requires a more varied corps of reviewers than a specialized journal may need, and its editing demands considerable skill on the part of some one or more persons who must know something about the presentation of scientific material as well as possessing a little knowledge of news commentation as an additive.

The matter to be selected for such presentation must in the main consist of the reporting of the results of original study, whether observational or based on independent investigation; whether retrospective or prospective in nature—a pat bit of biostatistical nomenclature.[1] Such material represents the hard substance of a journal, of which the rest is but the matrix. The remainder of the material, not necessarily in order of importance, may be reports of unusually interesting or instructive cases; analytic reviews of the progress in any field of medicine; brief reports of new methods in diagnosis or treatment or of instruments or apparatus; papers on social, economic or historical subjects, which may with caution verge on the philosophical; editorials on any subjects that may be of interest to physicians; reports of meetings, and other organizational material. But all this has been stated many times before.

The selection and often the solicitation of this content is the first function of the editor and his board, but particularly, of the board, for few physicians today, however experienced, would care to set themselves up as the sole directors of any journal's program. The second editorial function is to insist on clarity in diction and simplification of the text, purging it of unnecessary words in preference to abbreviating necessary ones.

The constant struggle of the editor—still an essential labourer in a persistently productive vineyard—is to try and hold in check the floods of words with which he is eternally beset. It is his job to cut specialty jargon to a minimum, substituting the short understandable word for the obscure, if more impressive one; to abbreviate titles without using abbreviations; to deplore, at least, the extremes of multiple authorship; to defend the principle of a minimum number of references, but to have them carefully authenticated. The purpose, in relation to a journal of this character, is to help the physician engaged in any of the complex activities of medicine to remain aware of its general progress.

The Massachusetts Medical Society, to turn a corner sharply, was incorporated in 1781, its charter—which has fortunately been perpetuated in plebeian print—being based on the premise that "Health is essentially necessary to the Happiness of Society," that "its Preservation or Recovery are closely Connected with the Knowledge of the Animal Œconomy, and of the Properties and Effects of Medicines," and that "The Benefit of Medical Institutions formed on Liberal Principles and encouraged by the Patronage of the Law are universally acknowledged." In order better to carry out these worthy objectives the Society in 1921 purchased the venerable *Boston Medical and Surgical Journal*, which has continued in current publication as the *New England Journal of Medicine*.

Eager to please the Society and the *Journal's* subscribers, its editors in 1952 sent out a questionnaire to its readers asking for information regarding their tastes in medical literature. Replies to the number of 8300 were received from nearly 19,000 who were questioned, which indicated a general addiction to reports of progress, original articles and the Case Records of the Massachusetts General Hospital.

In the belief that another reappraisal, however agonizing, was in order, two questionnaires were simultaneously sent on their way this summer and their returns are in process of tabulation. Of the current impertinences, one related to the editorial content of the *Journal* and the other to its advertisements. Fifty thousand subscribers were interrogated, the questionnaires going to alternate names on the mailing list of subscribers in the United States.

Incomplete but nevertheless substantial returns indicate that the *Journal's* content elicits the same relative interest as before, with the differences shaded to an inconsequential degree; 6861 unselected replies to the question regarding the average number of hours spent each week in reading the *Journal* showed that 1581 of those replying spent more than two hours in this absorbing pastime, 1634 spent two hours at it, and most of the rest gave it at least an hour, or so they said. Such figures represent no very elaborate statistical analysis, but they may be taken as a small sign that the reading of medical periodicals has not yet been entirely abandoned.

The reader reaction to advertising produced two interesting sets of figures that may be worth the attention of pharmaceutical manufacturers and of their advertising agents. The first of these reveals

that of 7432 subscribers whose replies are so far tallied, 6156 look at the advertisements and only 1276 ignore them. An appraisal of pharmaceutical advertisements in general by 6612 subscribers indicates that 1377 are satisfied with them, rating them fair to good, whereas 5235 rate them as poor to very poor. The ratings include many picturesque and unflattering comments.

No conclusions need be attached to this defence of the printed word, if it can be called a defence, or if the printed word when properly employed needs any championing.

In brief, there is no reasonable conflict among the various modes of mass communication if each is used according to its capabilities and with restraint. Those prophets who are fired with the new electric spark that has been given them must learn to what purpose it can best be put; the less promethean editor must remain conscious of his ever changing responsibilities, must sometimes become "resartus."

As I ventured to state on another occasion:

> The purpose of the medical reader is to broaden his view, not merely to find a simplified set of rules for earning his bread and butter. The specialist reads to learn about other specialties, the general practitioner to gain some familiarity with medical progress in general. Each must have some curiosity . . . . and the keynote for the editor in striving to fulfill the functions of his journal is to select material that will mark the path of progress, that will provide variety and maintain balance.[2]

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RÉSUMÉ

La faculté de transmettre à d'autres ses propres idées, émotions ou sensations a toujours marqué la différence qui distingue l'animé de l'inanimé. Même les créatures les plus primitives possèdent le moyen de signaler leur présence à leurs semblables. Cet article porte sur les moyens de communication chez les hommes. En dépit des prétentions de la technologie moderne, il n'en est pas moins vrai que les communications entre humains n'ont pas attendu le développement des méthodes prétendues "audio-visuelles" pour être visuelles et auditives depuis des millénaires. L'écriture s'étend du code d'Hammourabi aux complexités contemporaines des groupes d'initiales dont l'obscurité inhérente trahit souvent l'espoir de célérité. Le médecin de formation classique s'accommode mal du nouveau sens accordé à *Echo* qui maintenant n'évoque plus seulement dans son esprit les répétitions de la nymphe au rocher mais aussi les borborygmes dus à un virus sans parenté.

La menace que représente pour la forme écrite l'application de l'électricité aux moyens de communications est plus factice que réelle puisque l'envergure de ceux-ci est limitée par les sujets qu'ils peuvent traiter et par la composition des auditoires qu'ils peuvent atteindre. En médecine, la forme écrite demeure par excellence le fiduciaire des découvertes dans les sciences physiques et de l'expression des idées nouvelles. La valeur des connaissances acquises par la lecture repose sur l'effort de participation du lecteur et la rétention semble proportionnelle à l'activité du participant. L'écrit assure à la fois la permanence des archives de l'activité humaine et leur disponibilité pour fins de référence. La recherche médicale devenue presqu'une obsession de nos jours est cause de pléthore dans la publication — chaque auteur se sentant moralement obligé d'écrire et de faire paraître. Cette contribution déborde les frontières des méthodes audio-visuelles dont l'activité se résume surtout à l'enseignement post-universitaire sous forme de rappels, d'applications pratiques à l'exercice quotidien ou d'interprétation simultanée des travaux présentés à certains congrès.

En raison de l'énorme concurrence parmi les journaux qui se disputent les minutes précieuses que peut consacrer à la lecture le médecin affairé, chaque revue doit soigner le choix des ses articles et la forme de sa présentation. Ce choix doit porter surtout sur le rapport de travaux originaux et d'observations rétrospectives ou prospectives. Peuvent aussi s'ajouter des descriptions de cas intéressants, des bilans du progrès dans tel ou tel domaine, de brefs rapports de diagnostic ou de traitement etc. Une fois ce choix arrêté, les articles doivent être débarrassés des mots superflus et présentés sous une forme qui les rendra intelligibles au plus grand nombre possible de lecteurs. Le style de la revue devra donc éviter la verbosité, éliminer le jargon spécialisé et faciliter au médecin la tâche de se tenir au fait de l'évolution de la médecine. Les réponses à un questionnaire envoyé à ses lecteurs semblent indiquer que le *New England Journal of Medicine* réussit à capter leur intérêt au point d'être l'objet d'une heure ou deux (ou même plus) de lecture par semaine; la majorité des abonnés prend même le temps de regarder les annonces commerciales qui y sont insérées. L'auteur conclut cet exposé en déclarant qu'il n'existe pas de conflit entre les différents modes de diffusion de l'information médicale et que la chose écrite n'a pas à craindre la concurrence des ondes électroniques.

OBSERVATIONS ON EXTRADURAL HÆMORRHAGE

Hæmorrhage between the skull and dura is rare as a birth injury and rare under two years of age, but becomes more frequent between six and ten years. In adults, it is found most frequently in the third decade and becomes rare after the fifth. Generally, it is associated with a fracture of the vault of the skull as a result of a blunt head injury: traffic accidents, falls and blows to the head. Out of 27 patients, six had not suffered initial unconsciousness, in eight the first unconsciousness lasted less than 30 minutes, and six did not have a period of consciousness before operation. Extradural hæmatoma is unusual in severe head injuries or with depressed fracture. Closed fractures of the skull that cross the lines of the meningeal vessels, lateral, or sigmoid sinuses are the result of impact to the temporo-parietal region, and the bleeding comes from one of these vessels or from the diploic channels. The abrasion of the scalp, rather than the fracture if present, marks the site of the hæmatoma in most cases.

Though there is a lucid interval in most cases, if operation is not done the state of the patient progresses through stages of drowsiness, confusion, stupor and coma. Anterior fossa hæmorrhages progress slowly and show few signs of changed reflexes, paralysis or extensor rigidity, but two-thirds have unequal pupils and deterioration of the conscious state is marked. Middle fossa hæmorrhages are more common with severe headaches, and show weakness of the contralateral face and limbs, eye signs, and extensor rigidity going on to respiratory irregularity and cardiac arrest. Parasagittal hæmatoma also shows pyramidal and pupillary signs. Posterior fossa cases are associated with neck stiffness, headache, vomiting and cranial nerve palsies.

Early radiography may demonstrate a fracture across the middle meningeal vessels, may confirm that unconsciousness is due to trauma, and may show displacement of the pineal shadow, but indicated operative intervention should not be delayed while x-ray pictures are taken.

Out of 83 patients 19 died, a mortality of 23%; most deaths were due to delay in operative intervention.

It is suggested that the mortality can be lowered by training general surgeons in this lesion, improving the facilities for rapid operation in hospitals, suturing the dura to the pericranium, and making sure that all house doctors are aware of extradural hæmatoma.—H. Hooper, *Brit. J. Surg.*, 47: 71, 1959.

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THE PROBLEM OF RABIES IN CANADA*

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SEVENTY-FIVE years have passed since Louis Pasteur prepared the first vaccine for rabies and so laid the foundations of applied immunology. Immense advances in the prevention and treatment of infective diseases by biological methods have been made since that time, but our knowledge about rabies itself has increased very little. The vaccine in use today is still nothing more than a crude suspension of rabbit brain, treated to remove its infectivity; and in the presence of the declared disease the physician still remains powerless to intervene. If we turn our attention to the natural history of rabies we again find many old problems still unsolved, while the newer epidemiological discoveries still lack the detailed investigation needed for assessing their importance. This is particularly true of Canada at the present time. The information presented in this brief review may serve to emphasize the fact that rabies is still a public health problem of some importance here, even though the disease in man is now rarely seen.

EPIDEMIOLOGY

Rabies has long been endemic in North America. It is mentioned in the early records of the State of Virginia published over 200 years ago. Until recently, the emphasis has always been placed on the human disease and its transmission by the bite of rabid dogs. In this form it has been reported[6] in Canada in 32 of the 47 years between 1910 and 1957. The geographical distribution of these cases suggests that the infection was introduced from adjacent areas of the United States where the disease was in evidence at the same time.[5] These outbreaks were brought under control by measures directed against the dog population such as tie-up orders, quarantine and compulsory vaccination. Farm animals were seldom involved. The last human death from rabies occurred in Ontario in 1944.† Similarly, in the United States the mortality from this disease has fallen from 59 in 1937 to nine in 1956. Judged by these figures, rabies must be considered of very minor importance in North America; but we have other unquestionably valid reasons for our present interest in this subject.

In the year 1952, a sharp rise began in the incidence of rabies in Canadian domestic animals and wild life. This new epizootic has been described by Wells[6] and, more recently, by Edge.[1]

The figures given below are taken from a report issued by the Health of Animals Division, Canada Department of Agriculture. During the eight-month period April 1, 1958, to January 1, 1959, 2593 cases of animal rabies were reported in Canada: 351 diagnosed on clinical grounds alone and 2242 cases confirmed by laboratory examination. Of these 2242 confirmed cases, 2190 were located in Ontario and 48 in the province of Quebec, and only four cases in the rest of Canada. The species distribution was as follows:

Foxes	1066 (47.5%)	Sheep	91 (4.1%)
Cattle	756 (33.2%)	Dogs	71 (3.2%)
Skunks	101 (4.5%)	Horses	30 (1.3%)
Cats	96 (4.3%)	Other animals	31 (1.3%)

The present epizootic apparently originated in the Canadian North where a disease resembling rabies in its symptomatology has existed for at least 100 years in silver foxes. From these animals the disease is transmitted to the sledge dogs, with consequent serious economic loss and hardship among the Eskimos. The early records of this disease were collected and critically examined by Elton,[2] who suggested that lemmings, the chief source of food of the Arctic fox, form the original reservoir of infection. The proof that this disease is, in fact, rabies was not obtained until 1947 when Plummer[3] isolated the virus from dogs and foxes taken in the area of Baker Lake. The spread of the disease southward began in the early 1950's and by 1954 it had reached the Cochrane district of Northern Ontario and from there extended eastwards as far as the Quebec border. At about the same time, rabies appeared in Northern Alberta in the wild life and rapidly spread southward into many parts of the province.

There has been no recorded case of human rabies in the Northwestern Territories of Canada. The explanation usually offered is that heavy winter clothing is an effective protection against animal bites. There is an alternative hypothesis, however, which fits well in the general epidemiological picture. Different strains of virus, as they occur in nature, vary in pathogenicity and host affinity. For example, in Algeria there is a mild form of rabies known as *Oulou Fato*. This strain does not differ antigenically from classical rabies virus, yet it produces a paralytic disease in dogs, and only a very few cases of human rabies from this source have been reported. A further example is afforded by the bat-transmitted rabies of South America which produces a rapidly fatal disease in domestic animals but rarely affects man or dogs. The monograph of Schweinburg[4] contains a useful summary of the literature concerning these exotic forms of rabies.

There is strong evidence that the strain of virus causing the present Ontario epizootic has low pathogenicity for man. If this were not so, there

*From the Connaught Medical Research Laboratories, University of Toronto. Presented at the IX International Congress of Pædiatrics, Montreal, July 1959.
†Since this article was written, a fatal case of human rabies, confirmed by laboratory investigation, has been reported by the Health Department, Province of Ontario. [This case will be presented in the February 6, 1960, issue of the Journal.—ED.]

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would have been at least a few clinical cases of rabies among those who had been exposed to infection. We have collected the records of 83 persons who were bitten by rabid animals during the six-year period 1953-58, the diagnosis being confirmed in each case by laboratory examination. In this group there were several cases of severe bites, yet there were no vaccine failures. This is contrary to the experience of all countries where the classical form of rabies is prevalent. The very low fatality incidence in dogs points to the same conclusion because many of the farm dogs in the affected areas have not been immunized. There is always the danger that the present strain may change to a type which is more pathogenic for man and dogs. It is extremely important, therefore, that a resistant state be maintained in the dog population by mass inoculation with vaccine. This should be carried out with equal thoroughness in all farm animals. To the epidemiologist, at least, it seems wrong to pay farmers compensation for animals that have died of a disease which is easily preventable by vaccination.

We must now accept the possibility that bats may play a part in the transmission of rabies in Canada. In British Columbia the virus has been demonstrated in bats on several occasions, and there is at least one well-authenticated case in which a bat, subsequently proved to be rabid, attacked and bit a small boy. Some species of bat are migratory and these may be responsible for introducing the disease from the southern United States and Mexico where bat-transmitted rabies is known to occur. In Ontario during the winter of 1958-59 several incidents were reported[1] in which people were attacked and bitten by bats: no cases of rabies resulted. Further study of this subject is urgently needed.

CLINICAL ASPECTS

The magnitude of the clinical problem is indicated by the fact that in 1958 the Connaught Medical Research Laboratories issued sufficient rabies vaccine for the immunization of 2243 persons. Some of this vaccine may not have been used, but this would be offset by the probability that a few medical practitioners used vaccine obtained from another source. There were 2593 reported cases of rabies in animals during that year; so it is approximately correct to state that, on an average, one rabid animal produced one human exposure. Each of these people presented a problem to the doctor in attendance. Was the biting animal undoubtedly rabid and, if so, had the virus entered the tissues of the patient? How would the patient react to the inoculation of rabies vaccine? What was the risk of provoking a neuroparalytic accident?

The inoculation of rabies vaccine is attended or followed by various effects which are unpleasant for the patient and embarrassing for the physician. It is very important that the patient be warned that these reactions may occur. Mild or moderate reactions, both local and general, are fairly common, particularly in the obese and in those suffering from chronic liver disease. The risk of producing a severe neuroparalytic accident as the result of a full course of inoculations is about 1 in 1000. In India, the risk is stated to be about 1 in 19,000. It is probably greater in those who are prone to any of the conditions in which allergy plays a part. Unless the risk of developing rabies appears very great indeed, the early development of a severe reaction should be taken as an indication for stopping or modifying the plan of immunization. Severe or even fatal reactions may follow the injection of rabies vaccine in a person who has previously been immunized with this same vaccine. Veterinarians are particularly liable to run the risk of repeated exposure to the virus. In these circumstances it is imperative that the sensitivity of the patient be studied by preliminary intracutaneous injection of a 1 in 100 dilution of the normal vaccine. The use of cortisone has been recommended as a means of preventing these complications; it is also claimed to be of value in the treatment of the already established condition. Neuroparalytic accidents usually take the form of a flaccid paraplegia which clears up without residual weakness. Less common is an ascending myelitis of Landry type: this has a mortality of 20 to 30%. It is stated that in the United States there are annually 60,000 cases of human exposure to rabies virus requiring vaccine prophylaxis. If these figures are correct, we would expect about 60 neuroparalytic accidents to occur in that country every year from this cause alone. In addition, at least one-quarter of those vaccinated will show moderately severe local or general reactions. This situation will not improve until research has succeeded in producing a potent vaccine free from brain tissue. There is ample evidence from animal experiments that post-vaccination paralysis is due to an immunological reaction to brain substance and not to the presence of residual active virus in the vaccine. Attempts to remove the encephalitogenic factor from rabbit-brain vaccines have been made by several investigators but so far no practical method of doing this has been found. The introduction of vaccines prepared from chick or duck embryo seemed at first to provide the answer to this problem, but later work suggests that, in man, the immune response to this type of antigen is poor and irregular. Intensive research on the nature of the viruses is now being carried out in laboratories throughout the world. Methods of separating these infective agents from host cell constituents are essential preliminaries to such work. It is hoped that discoveries made in this way may soon find practical application in the production of a safe and satisfactory rabies vaccine.

This short article will conclude with a note on diagnosis. In a typical case of rabies the symptoms

are highly characteristic and easily recognized. However, if there is no clear-cut history of exposure and the initial hyperæsthetic phase is diminished or absent, the clinical picture may suggest a Landry's syndrome due to poliovirus or some other agent causing myelitis. The last case of human rabies in Canada was of this type.

It has been suggested above that the strain of virus now circulating in our wild life is a variant with low pathogenicity for man and dogs. If this is correct, a human infection would probably be clinically atypical and the correct diagnosis might be missed unless a very thorough virological examination were carried out. This may be no more than an attractive hypothesis but it seems worth presenting. The possibility of rabies should be considered in any case of ascending myelitis in which the more usual causes have been excluded.

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RÉSUMÉ

Les progès accomplis dans la prévention et le traitement des maladies infectieuses ont été immenses depuis que Pasteur a préparé son premier vaccin contre la rage il y a 75 ans et cependant notre connaissance de cette dernière maladie ne s'est guère améliorée, non plus que le sérum que l'on emploie encore de nos jours. Le dernier cas fatal de rage humaine au Canada fut rapporté en Ontario en 1944. Même si la rage n'évoque la plupart du temps que sa transmission à l'homme par la morsure d'un chien infecté, la véritable importance du problème dépasse beaucoup cette conception étroite. L'année 1952 a vu une montée en flèche de la fréquence de la rage au Canada chez les animaux sauvages et domestiques. Dans une période de huit mois en 1958, 2593 cas furent déclarés au département de l'agriculture—près de la moité chez les renards et un tiers dans le bétail. Il faut aussi se méfier des chauves-souris. Cette épizootie a débuté dans le nord de l'Ontario où la maladie a été signalée chez les regards argentés depuis au moins cent ans. Les lemmings en seraient le réservoir. Il appert que le virus en cause ne posséderait qu'une basse pathogénicité pour l'homme: 83 personnes ont été mordues par des animaux enragés depuis six ans et dans chaque cas le vaccin s'est montré efficace pour enrayer l'infection. Ce caractère du virus est susceptible de se modifier d'où l'importance de la vaccination préventive de tous les chiens ainsi que des animaux de ferme.

L'administration du virus antirabique entraîne des effets secondaires désagréables pour le malade; il importe donc de l'en avertir. Le risque de déclencher une paralysie serait de l'ordre de 1:1000. On peut le rattacher à l'allergie. Une deuxième série d'injections chez quelqu'un qui a déjà été traité peut être fatale; la sensibilité du malade doit donc être déterminée avant d'entreprendre un second traitement même si la cortisone en diminuait les risques. Les impuretés provenant du broyat de cerveau de lapin sont en cause; aucune méthode satisfaisante de purification n'a encore été découverte. Le problème réside dans la séparation de l'agent infectieux des cellules qui le contiennent. En dehors des cas typiques où la symptomatologie est évidente, on peut aussi voir des cas de rage mue qui évoquent un syndrome de Landry simulant une forme quelconque de myélite, comme par exemple la poliomyélite. Dans ces formes obscures, l'examen virologique s'impose.

DIRECT ARTIFICIAL RESPIRATION (D.A.R.): PRESENT-DAY TEACHING AND GROUP TRAINING REQUIREMENTS*

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JOSEPH BROOK, M.D., *Saskatoon, Sask.*

THE MOUTH-TO-MOUTH or "rescue breathing" technique of applying artificial respiration has received a great deal of publicity in the recent medical and lay press.

The writers prefer to classify the various systems of artificial respiration into two main groups:

1. Direct Artificial Respiration (D.A.R.)
   - (a) mouth to mouth (M-M)
   - (b) mouth to nose (M-N)
   - (c) mouth to airway (M-A)
   - (d) mouth to mask and mask to mask
   - (e) positive pressure pulmonary ventilation using mechanical devices
2. Indirect Artificial Respiration (I.A.R.)
   - (a) Holger-Nielsen
   - (b) Schafer
   - (c) Sylvester
   - (d) Barrel rolling or other body-rocking techniques
   - (e) Mechanical pulmotor equipment

The superior effectiveness of D.A.R. applies to all age groups and to all emergency situations in which oxygen is required.

This method as the procedure of choice for use in emergency resuscitation has gained increasing popularity in recent months, particularly with medical and first-aid authorities* in the U.S.A., Canada, and Denmark.[1]

However, distinct disadvantages and objections exist which render the method impracticable at this time for universal adoption by all first-aid authorities, for introduction into their training programs.

The main objections raised by these authorities† have been variously stated as follows:

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*American National Red Cross; National Academy of Sciences (U.S.); National Research Council (U.S.).
†The Canadian Red Cross Society; The St. John Ambulance Association.

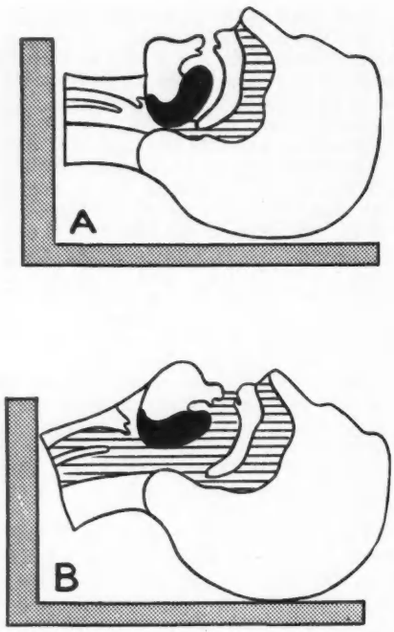

Fig. 1. Air Passage Demonstrator.—(A) In the face-up position the lower jaw and tongue fall back, obstructing the air passage. (B) The air passage may be opened by either tilting the head backward or lifting the jaw forward.

1. The æsthetic difficulties arising both in applying this method and in teaching it.

2. The problem of communication of disease.

3. Lack of a satisfactory technique for training groups in this method. (a) Lectures and visual aids in themselves are not sufficient. (b) The use of an airway as an adjunct in training, or in applying the method, is not considered advisable because of the danger of throat trauma and of obstructing the victim's airway and/or inducing vomiting, when used by inexperienced personnel. (c) It is not as simple to apply and teach as is generally believed.

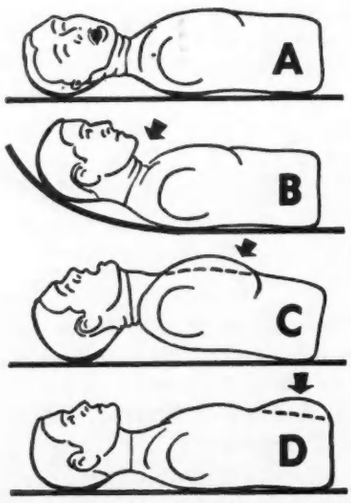

Fig. 2. Brook Manikin.—The Brook Manikin is designed to imitate a victim of asphyxia. It contains lifelike anatomical features which enable trainees to learn the fundamental steps of direct artificial respiration by the mouth-to-mouth, mouth-to-nose and mouth-to-airway methods.

The head may be turned to either side for clearing the mouth (A). It moves from the flexed (B) to the fully extended (C) position. The nose contains a nasal passage, which may be closed by pinching the nostrils. The mouth contains a tongue for teaching the insertion of an airway. The air passage is open in the fully extended position and closed in the flexed position. In the neutral position, air may enter both the chest and the stomach. The chest deflates itself; the stomach requires gentle pressure for deflation (D). The manikin may be cleaned inside and out between demonstrations, owing to its special construction.

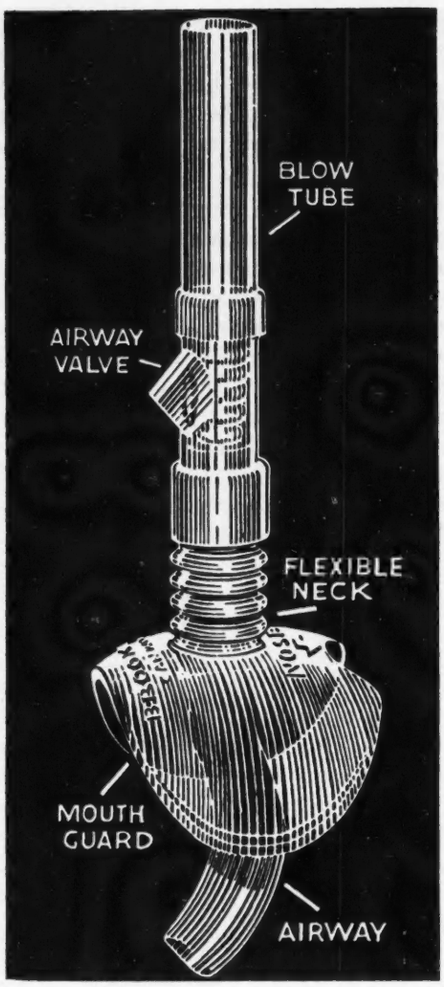

Fig. 3.—Description of the Brook Airway (Canadian patent No. 574,736). Adult model.

The Airway: when placed in position over the tongue, helps overcome obstructions and directs the air to the lungs. The soft pliable airway is designed to avoid irritation and gagging. A bite-block (metal insert) prevents collapse of the airway.

The Mouthguard: provides an efficient seal against the escape of air directed at the lungs.

The Flexible Neck: is non-collapsible, allowing the airway to be manipulated to any required position.

The Airway Valve: fits into the flexible neck extension and accommodates the blow tube. Air is blown through the one-way valve into the lungs. The exhaled air of the victim escapes through an exhaust port and does not reach the end of the blow tube used by the operator.

The Blow Tube: fits into the airway valve and provides a mouthpiece for the rescuer.

We have realized for some time that the general adoption of D.A.R. for teaching and the training of classes by our medical schools and public health and civil defence authorities would of necessity have to await the development of a safe and practical group-training technique. It was with this goal in mind that a project was undertaken in Saskatoon and has now been in progress for over a year.

Preliminary research studies were undertaken to confirm the findings reported previously by the groups working with Dr. J. O. Elam[2a] and Dr. P. Safar,[2b] and reported in a comprehensive sym-

Fig. 4.—Using the Brook airway.

Place victim on back, clear mouth and throat of foreign matter. Insert airway over tongue. Tilt head fully back and support chin. Hold airway in position—pinch nostrils as illustrated. Take deep breath and blow into airway. Repeat every three to four seconds.

posium on mouth to mouth resuscitation by the Council on Medical Physics, A.M.A.[2c]

Various training techniques were tried on different groups to determine their educational value. *The following difficulties were encountered* in these training classes (special attention was given to developing a technique suitable for training the average layman):

1. The M-M and M-N methods proved to be impracticable even when employing trained "victims" or attempting to train laymen in family groups.

2. The æsthetic problem and the danger of communicating diseases were factors to a greater or lesser extent, but the difficulty of simulating the actual situations met with in the field presented the chief obstacle.

3. The showing of well-prepared educational films* was in itself insufficient to cause the trainees to feel competent to apply the method in an emergency.

The use of an airway was welcomed by the large majority of trainees. Its insertion could be taught with ease, when an airway was used which was shortened sufficiently to avoid throat irritation or gagging.

An air-passage demonstrator, a manikin, a training film and the Brook airway were developed and used as training aids to work out *the following proposed technique* for demonstration and group training in D.A.R.

STEP 1: The subject of artificial respiration is introduced by a short talk, followed by the showing of a comprehensive film on D.A.R.†

STEP 2: An air-passage demonstrator (Fig. 1) is used to show the importance of the initial steps of proper positioning of the head and jaw to establish a patent airway (regardless of which method of artificial respiration is being taught).

STEP 3: The various techniques of direct artificial respiration are demonstrated on the manikin (Fig. 2) (M-M, M-N, and M-A, using the Brook Airway). See Figs. 3, 4 and 5 for use of the airway.

STEP 4: Each member in the group is then provided with his own blow tube and safety valve (inexpensive and in sterile package) in order to train under supervision.

STEP 5: The trainees are requested to return a second time to demonstrate their ability to apply D.A.R., using the methods on the training manikin.

STEP 6: A reminder wallet card or information handbook is then given to the trainee (see Table I).

Repeated indoctrination (via news media, magazines, TV, etc.) is required to refresh the memory of those trained in D.A.R.[3a, b]

SUMMARY AND CONCLUSIONS

A safe and practical method of demonstration and group training in direct artificial respiration (D.A.R.) is described. This project was undertaken in order to facilitate the adoption of the direct method of artificial respiration by first aid and civil defence authorities. An extensive program of education is required to place this knowledge in the public domain. This, along with the advances to be made in the field of prevention, will go a long way towards saving some of the many lives that otherwise would be lost as a result of accidents.

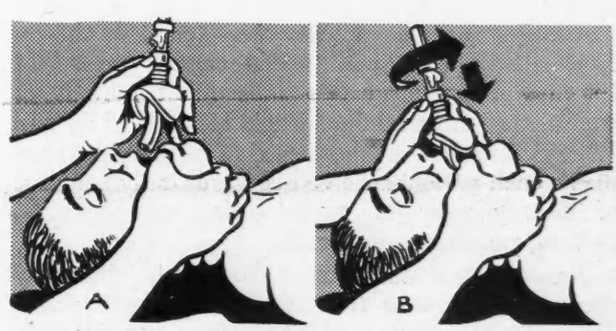

Fig. 5.—Airway—reverse insertion technique (alternate method). (A) The airway is inserted in reverse as illustrated. (B) The end of the airway is passed along the roof of the mouth and over the tongue. Then it is rotated into position by applying a one-half turn so that the notch will lie under the nose. This method is preferred in the training of first-aid personnel and others who are not skilled in the use of oral airways.

*"Rescue Breathing"—produced by Lewis and Marguerite S. Herman and distributed by American Film Producers, New York.

†"That They May Live"—produced by the College of Medicine, University of Saskatchewan, and distributed by Pyramid Movie Distributors Ltd., 315 Garrison Cres., Saskatoon.

TABLE I.
DIRECT ARTIFICIAL RESPIRATION
(MOUTH-TO-MOUTH METHOD)

1. Place victim on back immediately.
2. Clear throat of water, mucus, toys, coins or food.
3. Tilt head back *as far as possible* to sniffing position.
4. Lift jaw up to keep tongue out of air passage.
5. Pinch nostrils to prevent air leakage when you blow.
6. Blow into mouth until you see the chest rise.
7. Listen for snoring and gurgling—signs of throat obstruction.
8. Repeat blowing 10-20 times a minute.

We wish to express our thanks to the many who have contributed to the development of this training and educational program:

Dr. J. Wendell Macleod, Dean of Medicine, University of Saskatchewan, for his encouragement and support.

The members in the Department of Anæsthesiology, University of Saskatchewan, for their active participation, Dr. Allen B. Dobkin and Dr. W. E. Upthegrove; Dr. Gordon M. Wyant and Dr. Christopher J. Kilduff for their helpful advice.

Dr. Lewis M. Brand, Divisional Surgeon, The St. John Ambulance Association, for his assistance, and Dr. A. E. Buckwold, who acted on the research planning committee.

Dr. J. O. Elam of Buffalo, N.Y., Dr. P. Safar of Baltimore, and Dr. H. Ruben of Copenhagen for their invaluable assistance in keeping us abreast with their progress in this field through personal communications.

Special thanks are offered to Dr. Safar for his assistance in the development of an improved airway: a result of the critical tests to which he exposed earlier Brook Airway prototypes; and for imparting some of his great enthusiasm.

Generous assistance was also received from Dick Stoll, Director of Safety Services, Buffalo Chapter, American Red Cross, and from Captain Martin C. McMahon of the Baltimore Fire Department Ambulance Service: relating their experiences in the application and training of mouth to mouth artificial respiration.

Credit is given to Mr. E. Sebestyn of Saskatoon for the art work required to prepare the illustrations.

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RÉSUMÉ

Les méthodes de respiration artificielle peuvent être réunies en deux groupes, à savoir, la respiration artificielle directe et l'indirecte. Malgré sa plus grande efficacité la méthode directe n'en présente pas moins certaines difficultés d'ordre esthétique, infectieux et pédagogique qui s'interposent dans son adoption par les groupes d'ambulanciers, de défense civile, d'hygiène publique et de médecine industrielle. Ces difficultés peuvent être contournées par l'emploi d'un tube à insufflation et d'un mannequin de démonstration. Les auteurs soumettent dans ses grandes lignes un programme de diffusion de cette méthode.

THE EFFECTS OF PREDNISONE IN TWO PATIENTS WITH PRIMARY BILIARY CIRRHOSIS*

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THERE ARE few reports regarding the effects of steroid therapy in patients with primary biliary cirrhosis. The present study deals with the effects of prednisone in two such patients, with particular reference to observations made during the course of controlled nitrogen balance studies.

PROCEDURE AND METHODS

Nitrogen balance studies were carried out on two patients during an initial control period of 15 days and during two subsequent periods of administration of adrenocortical steroids of 33 and 37 days. Throughout the period of nitrogen balance study, each patient received constant daily amounts of dietary nitrogen, protein, fat, carbohydrate, sodium, potassium and fluid.

Urine and stools were collected in three-day pools and analyzed for nitrogen by the Kjeldahl method.[1] Also, two or three times weekly, the following determinations were made: total and direct-reacting serum bilirubin,[2] serum phospholipid,[3] total serum cholesterol,[4, 5] total serum proteins, albumin and globulins,[6] non-protein nitrogen,[7] blood urea nitrogen,[8] cephalin-cholesterol flocculation,[9] thymol turbidity,[10] serum alkaline phosphatase,[11] serum electrolytes,[12] including phosphorus[13] and calcium,[14] hæmoglobin, prothrombin activity (Quick test), total white blood cell count, and erythrocyte sedimentation rate (modified Westergren method). Blood sugar levels (method of Folin-Wu, modified) were determined at frequent intervals both in the fasting state and two hours postprandially.

Apart from the balance study period, the same laboratory determinations were made at irregular intervals throughout the whole period of observation of these patients.

CASE 1.—A.D., a 41-year-old white male mariner, stated that he had had an episode of jaundice in September 1953, and again during the spring and fall of 1954. Each bout was preceded by a swelling in the left parotid region and a sore throat. He was treated as an outpatient at another centre during the initial attack. He stated that the jaundice lasted about four weeks and was associated with pale-coloured stools and "slight indigestion". He could provide little information about the second attack, which was apparently mild and of short duration. During the third episode he was admitted to hospital at another centre. His liver edge was reported as six cm. below the right costal margin. The spleen was not palpable. A few small, non-tender, supraclavicular lymph nodes were found. Total serum bilirubin measured 5.5 mg. %,

*From the Department of Medicine, Shaughnessy Hospital, and the University of British Columbia, Vancouver, B.C.

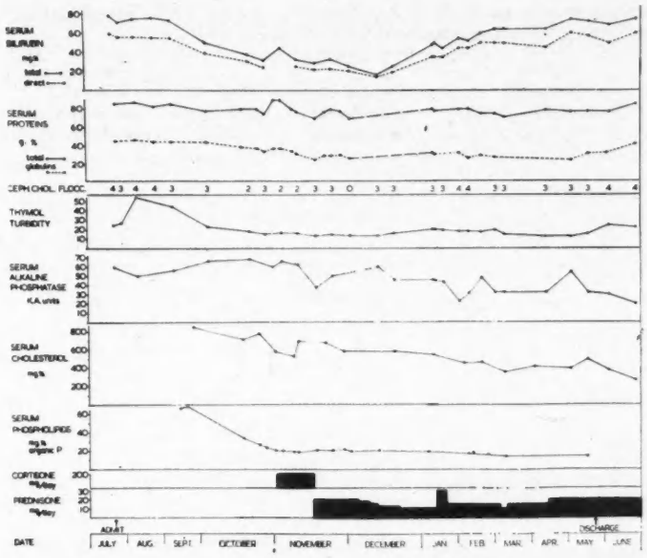

Fig. 1.—Case 1, A.D. Results of serial tests of liver function from July 22, 1955, to June 27, 1956. The laboratory findings from October 18 to December 5, 1955, during which time balance studies were performed, are also shown in Fig. 2. Intravenous hydrocortisone administration for 48 hours at the time of laparotomy in April 1956 is not shown here.

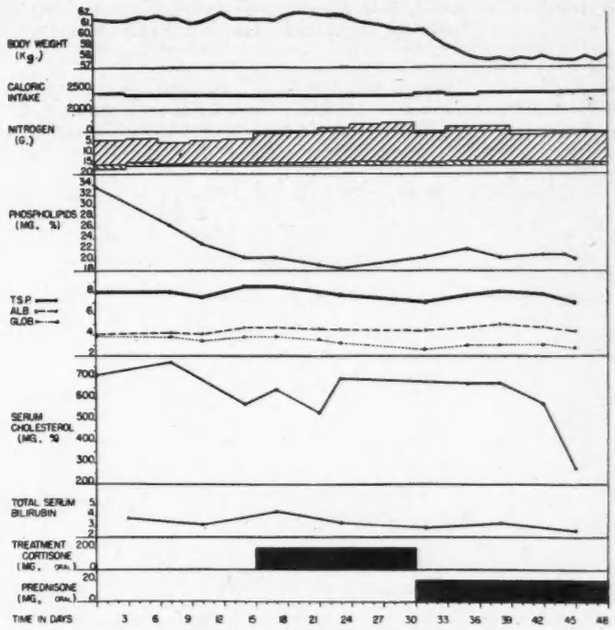

Fig. 2.—Case 1, A.D. Results of laboratory tests carried out during nitrogen balance studies from October 18 to December 5, 1955. The last serum cholesterol level illustrated in this figure is probably a laboratory error in view of the preceding and subsequent determinations.

direct 3.3 mg. %; cephalin-cholesterol flocculation test +3, total serum proteins 7.95 g. %, albumin 3.4 g. % and globulins 4.55 g. %. His jaundice was reported to have cleared within a week and he was discharged with a diagnosis of recurrent hepatitis.

The patient was admitted to Shaughnessy Hospital on July 17, 1995. He complained of dark urine and pruritus of three weeks' duration, but except for some weakness felt fairly well. The patient was classed as of low intelligence and a poor witness. He appeared lethargic, was mildly depressed and expressed some paranoid thoughts; was well-nourished and slightly jaundiced with multiple spider angiomata about the neck, chest and shoulders. A sharp, firm and slightly tender liver edge was palpable five cm. below the right costal margin in the mid-clavicular line. The liver surface was thought to be finely nodular. The spleen was just palpable and was slightly tender. There was marked acne of the skin. The values from laboratory studies (Table I and Fig. 1) were: total serum bilirubin 7.8 mg. %, direct 5.9 mg. %; cephalin-cholesterol flocculation test +4; thymol turbidity 24 units; alkaline phosphatase 60 King-Armstrong units; total serum proteins 8.6 g. %, albumin 4.0 %, and globulins 4.6 g. %. Skin and lymph node biopsies and radiographs of the hands revealed no abnormalities. A needle aspiration biopsy of the liver was performed on September 9, 1955. However, the specimen obtained was small and inadequate for proper evaluation.

During the first four months in hospital, his condition remained unchanged except for a bout of staphylococcal furunculosis in September 1955. The laboratory findings were essentially unchanged except for a fall in the serum bilirubin level (Fig. 1). His clinical and laboratory findings were considered to be compatible with a diagnosis of primary biliary cirrhosis.

In October 1955, nitrogen balance studies were carried out during a control period from October 17 to November 1, 1955, and subsequently, during steroid administration (Table I and Fig. 2). Throughout the period of study his dietary and fluid intake were constant. He received a daily diet made up of protein 102 g., nitrogen 16 g., fat 40 g., carbohydrate 400 g.; fluid 2165 ml., sodium 41 mEq., and potassium 56 mEq. On completion of the control period, he was given cortisone 50 mg. four times daily by mouth for 16 days from November 2 to November 17, and then prednisone (Meticorten, Schering) orally, 5 mg. four times daily for a further 17-day period from November 18 to December 4, 1955. An increase in appetite and sense of well-being began about one week after the institution of cortisone therapy and was maintained throughout the period of steroid administration. He became much more energetic and cheerful. At the start of the balance study, his weight was 136 lb. and he lost nine lb. during the period of controlled caloric intake. While receiving steroids, his liver edge initially descended another two cm. below the right costal margin and then receded to a constant level of 6-7 cm. Towards the end of the period of cortisone therapy, there was a transient rise in postprandial blood sugar levels to a maximum of 242 mg. %, although fasting blood sugar levels remained normal. When prednisone therapy was instituted, he developed minimal swelling of his ankles and a "moon face". These signs subsided a few days after sodium intake was decreased. Serum sodium concentrations ranged from 134 to 140 mEq./l. and serum potassium from 3.7 to 4.3 mEq./l. during the balance study.

After completion of the balance studies, he received oral prednisone in doses ranging from 10 to 30 mg. a day and continued to feel well. During the period of the balance study, while cortisone and prednisone were being administered, the total serum bilirubin fell from 4.4 to 2.6 mg. %. Shortly after the termination of the balance studies, serum bilirubin levels rose and remained high for the entire period of subsequent observation. Slight ankle œdema and minimal ascites appeared in January 1956, and persisted intermittently in spite of treatment with mercurial diuretics. The results of tests of liver function carried out during the seven months of observation following the institution of prednisone therapy are shown in Table I and Fig. 1.

TABLE I.—CASE 1, A.D. RESULTS OF SERIAL LABORATORY DETERMINATIONS FROM JULY 22, 1955 TO JUNE 27, 1956. THE PERIOD OF THE NITROGEN BALANCE STUDY IS INDICATED. THESE RESULTS ARE SHOWN IN FIGS. 1 AND 2.

Date	Serum bilirubin Direct (mg.%)	Serum bilirubin Total (mg.%)	Serum phospholipid (mg.P %)	Serum cholesterol (mg.%)	Serum proteins total, alb./glob. (g.%)		Cephalin-cholesterol flocculation	Thymol turbidity (units)	Serum alkaline phosphatase (K.A. units)
Normal values	0.4	1.0	8 - 14	150 - 250	Total 6.0 - 8.0 Alb. 4.0 - 6.0 Glob. 2.0 - 3.0		0 - +1	0 - 5	5 - 13
1955									
22/7	5.9	7.8					4	24	60
25/7					8.6	4.0/4.6			
10/8	5.6	7.4			8.7	4.0/4.7	4	54	50
26/8	5.4	7.6			8.2	3.8/4.4	4		
9/9	5.4	7.3			8.5	4.1/4.4	3	44	56
16/9			66.0						
19/9			68.0						
26/9				850					
4/10	3.9	5.0			7.8	3.8/4.0	3	23	66
	Balance studies:								
	(a) Control period								
18/10			33.8	710	8.0	4.1/3.9			
21/10	3.1	3.8					2	18	68
25/10			26.5	770	8.0	4.2/3.8			
28/10	2.4	3.2	23.1		7.5	4.1/3.4	3	15	
31/10									60
1/11			20.5	575	8.5	4.7/3.8			
	(b) Cortisone 200 mg./day								
4/11		4.4	20.5		8.5	4.7/3.8	2	16	66
8/11			19.1	530	8.0	4.5/3.5			
10/11	2.6	3.3	18.5	690	7.7	4.5/3.2	2	16	62
	(c) Prednisone 20 mg./day								
18/11	2.2	2.9	20.6	295*	7.0	4.4/2.6	3	13	38
22/11				670	7.7	4.7/3.0			
25/11	2.3	3.3	20.5		8.0	5.0/3.0	3	14	50
29/11			21.0	575	7.8	4.7/3.1			
2/12	2.1	2.6	19.3	275*	7.0	4.3/2.7	0	13	
	End of balance studies								
13/12	1.4	1.7	20.3				3	13	60
20/12	1.9	2.6		575			3	16	46
1956									
6/1			18.7						
11/1	3.6	4.7		540	8.0	4.7/3.3	3	20	46
20/1	3.5	4.4					3	19	43
3/2	4.4	5.4			8.0	4.7/3.3	4	18	22
6/2				450					
10/2	4.4	5.2			8.0	5.3/2.7	4	18	31
21/2	5.0	6.0		460	7.5	4.5/3.0		17	48
2/3	5.0	6.4			7.5	4.7/2.8	3	19	32
9/3	4.9	6.4	13.3	350	7.1		3	15	32
4/4				410					
13/4	4.6	6.4			7.9		3	12	32
4/5	6.1	7.5		390	7.7	5.2/2.5	3	12	54
17/5			13.2						
18/5	5.7	7.3		490	7.8	4.6/3.2	3	15	32
5/6	5.0	6.9		370	7.7	4.4/3.3	4	24	30
27/6	6.0	7.6		260	8.6	4.4/4.2	3	22	20

*This value is probably a laboratory error, in view of the preceding and subsequent determinations.

Throughout the period of study and observation the results of other serial blood determinations were as follows: non-protein nitrogen 22-32 mg. %, blood urea nitrogen 8.3-14.3 mg. %, serum calcium 9.0-10.5 mg. %, serum phosphorus 3.6-5.2 mg. %, prothrombin activity 86-100% of normal, hæmoglobin 10.7-12.0 g. %, and total white blood cell count 5900-11,000 per c.mm. During the administration of prednisone, there was a gradual fall of the postprandial blood sugar levels to normal, and they remained normal until the end of the period of observation.

In February 1956, xanthelasma at the medial canthus of each eye and xanthomatous deposits in the flexor digital creases of both hands were noted and these persisted.

In April 1956, an exploratory laparotomy was performed without difficulty. Intravenous hydrocortisone was given for 48 hours at this time. The liver surface was described as "bile-stained" and irregular, with numerous nodules of varying size. No evidence of extrahepatic disease was found and operative cholangiography revealed no abnormalities. A surgical biopsy of the liver was performed. Microscopic examination showed mild distortion of the lobular architecture by areas of fibrous tissue and mononuclear cell infiltration extending from the portal tracts. There was proliferation

of bile ducts which were collapsed. The parenchymal cells appeared normal. In some areas bile plugs were seen in canaliculi. The findings were considered to represent the changes of primary biliary cirrhosis.

The patient was discharged to a convalescent hospital in May 1956 and continued to take oral prednisone 10 mg. a day until June 1956, when he last visited Shaughnessy Hospital. After three episodes of hæmatemesis in September 1956, he was admitted to the Vancouver General Hospital on September 30, 1956, deeply jaundiced, slightly drowsy, and dehydrated; blood pressure, 90/50 mm. Hg. The liver edge was four fingers' breadths below the right costal margin and firm; the spleen was palpable. Ascites was present and superficial veins over the abdomino-thoracic wall were prominent. Hæmoglobin was 4.2 g. %. Other laboratory values were reported as follows: total serum bilirubin 7.3 mg. %, direct 5.1 mg. %; serum alkaline phosphatase 59 K.A. units; total serum proteins 6.8 g. %, albumin 2.4 g. %, globulins 4.4 g. %; thymol turbidity 6 units, serum cholesterol 178 mg. %, non-protein nitrogen 33 mg. %, and urinary urobilinogen 0.5 Ehrlich units %. Radiological examination revealed evidence of œsophageal varices.

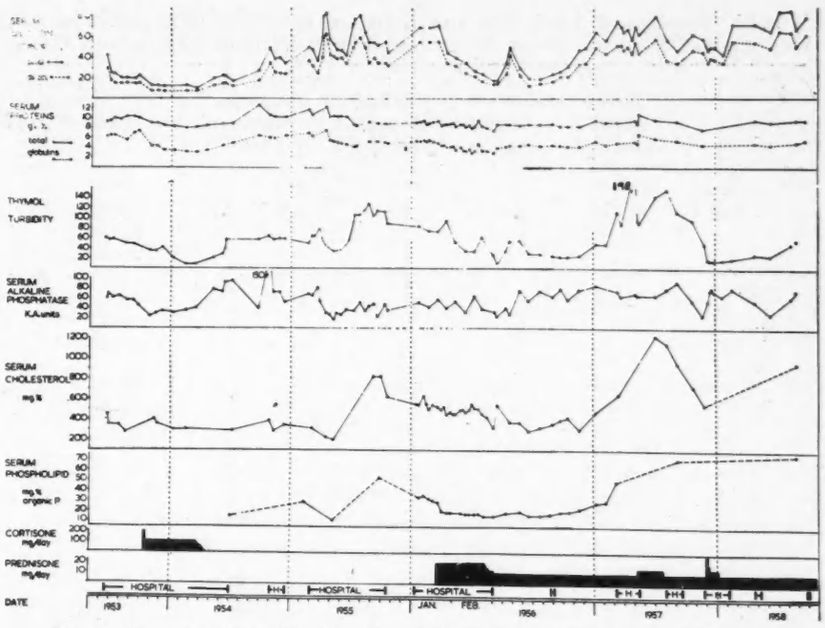

Fig. 3.—Case 2, J.A.L. Results of serial laboratory determinations from June 1953 to September 1958. The laboratory findings from January 4 to February 25, 1956, during which time nitrogen balance studies were performed, are also shown in Fig. 4.

All determinations of the tests noted are shown in this figure, although many are omitted from Table II in order to conserve space.

He was given 21 bottles of whole blood during the ensuing six weeks, at the end of which his bleeding appeared to have stopped. He was transferred to a nursing home on January 10, 1957, where he died after a hæmorrhage on February 22, 1957.

Autopsy was performed the next day. The liver weighed 2300 g. and was intensely green and very firm. The surface was uniformly nodular, the nodules measuring 0.5 to 1.0 cm. in diameter. The cut section was firm and dark green, and showed numerous white fibrous strands. The spleen was firm and weighed 675 g. Peritoneal fluid measured 4500 ml. Microscopical sections of the liver showed gross disturbance of lobular architecture with marked fibrosis, presenting the picture of multilobular cirrhosis. No increase in fat but an increase in the number of small bile ducts and slight evidence of cholestasis were noted. The pathologist's conclusion was that the findings were those of "postnecrotic portal cirrhosis". It is the conclusion of the authors that the clinical and laboratory findings and the histological observations from liver biopsy obtained at laparotomy were compatible with a diagnosis of primary biliary cirrhosis, and that the additional findings at autopsy represent superimposed secondary effects of hepatic injury. This sequel has been described by Ahrens *et al.*,[15] Anderson[16] and MacMahon.[17]

CASE 2.—J.A.L., a 40-year-old white male accountant, had been treated in another Vancouver hospital in 1952 for what was diagnosed as infectious hepatitis. The laboratory determinations were reported as: serum bilirubin 4.5 mg. % with 74% direct-reacting; total serum proteins 8.2 g. %, albumin 4.1 g. %, globulins 4.1 g. %, cephalin-cholesterol flocculation +1, and prothrombin activity 40-90% of normal. During the preceding five years he had felt well except for occasional vague abdominal discomfort and night sweats. He had never been jaundiced previously.

He was first admitted to Shaughnessy Hospital in June 1953 with jaundice, clay-coloured stools, dark urine, anorexia, a weight loss of 30 lb., night sweats, and dull right upper quadrant pain. These had all been present with fluctuations since his previous hospital stay. Previous illnesses included "dysentery" in 1943 and pulmonary tuberculosis first diagnosed in the Middle East during World War II and treated conservatively in various military hospitals until the time of his discharge from the army in 1946. His mother had diabetes mellitus. He was rather poorly nourished and mildly jaundiced. A smooth, firm, non-tender liver edge was palpable six cm. below the right costal margin in the midclavicular line and its surface was smooth. The spleen was not palpable. Blood pressure was 120/85 mm. Hg. Initial laboratory determinations in June 1953 (Table II and Fig. 3) were: total serum bilirubin 4.2 mg. %, direct 3.0 mg. %; total serum proteins 9.2 g. %, albumin 3.0 g. %, globulins 6.2 g. %; cephalin-cholesterol flocculation +3, thymol turbidity 60 units, serum alkaline phosphatase 60 K.A. units and serum cholesterol 450 mg. %. A needle biopsy of the liver in September 1953 showed findings compatible with primary biliary cirrhosis.

Treatment included complete bed rest, a high-calorie, high-protein, low-fat diet, and supplementary amounts of vitamins B and K. The high serum bilirubin and serum cholesterol levels subsided towards normal (Table II, Fig. 3) but there was no corresponding symptomatic improvement. Cortisone 25 mg. four times daily by mouth was given from October 1953 to April 1954. During this period, he improved generally and his sense of well-being, appetite and weight increased. As noted in Table II and Fig. 3, the serum bilirubin

TABLE II.—CASE 2, J.A.L. RESULTS OF LABORATORY DETERMINATIONS FROM JUNE 1953 UNTIL SEPTEMBER 1958. THE PERIOD OF NITROGEN BALANCE STUDY IN JANUARY-FEBRUARY 1956 IS INDICATED. THESE RESULTS ARE REPRESENTED IN FIGS. 3 AND 4.

Date	*Serum bilirubin* *Direct* (*mg.%*)	*Total* (*mg.%*)	*Serum phospholipid* (*mg.P %*)	*Serum cholesterol* (*mg.%*)	*Serum proteins total, alb./glob.* (*g.%*)		*Cephalin-cholesterol flocculation*	*Thymol turbidity* (*units*)	*Serum alkaline phosphatase* (*K.A. units*)
Normal values	0.4	1.0	8 - 14	150 - 250	Total 6.0 - 8.0 Alb. 4.0 - 6.0 Glob. 2.0 - 3.0		0 - +1	0 - 5	5 - 13
1953									
16/6	3.0	4.2					3	60	
18/6					9.2	3.0/6.2			60
23/6				450					
14/8	1.6	2.1		277	10.2	4.6/5.6	2	49	
23/9	1.6	2.3			10.0	2.7/7.3	3		46
	Cortisone 100 mg./day								
30/10	0.7	1.3			8.9	4.7/4.2	0	36	24
17/11	0.8	1.3			8.9	4.7/4.2	0	35	30
18/11				360					
1954									
8/1					8.2	4.8/3.4	0	21	31
9/1				300					
16/2	0.7	1.3		310	7.9	4.8/3.1	0	8	36
16/3	0.7	1.0			8.1	5.1/3.0	0	9	
	Cortisone discontinued								
4/6	1.4	2.3			8.8	4.4/4.4	0	29	73
30/6			15.8						
2/7	1.2	1.7		290	8.9	4.0/4.9	1		96
22/9	1.8	2.7			12.6	6.2/6.4	2	58	40
26/10	3.4	4.9		385	10.6	4.6/6.0	1	65	150
10/12	2.4	3.4		345			2	60	52
1955									
10/2			28.3						
4/3	3.2	4.8		315	10.7	4.3/6.4	4	66	66
15/4	6.3	8.3		225	12.3	4.8/7.5	3	44	36
6/5	4.1	5.3	11.5	200	10.4	5.2/5.2	2	34	18
5/7	5.0	7.2			8.7	4.5/4.2	2	93	35
23/8	3.6	5.4			9.2	3.9/5.3	4	128	44
30/9				820					
3/10			52.9						
18/10	3.3	4.5		620	8.9	4.0/4.9	2	90	38
	Balance studies—control period								
1956									
5/1			33.3						
6/1	5.5	6.9		540	9.2	3.9/5.3	3	84	51
9/1			35.1	630	9.5	4.0/5.5			
11/1				550	8.7	3.5/5.2			
13/1	5.5	6.9	31.9	500	9.0	3.4/5.6		75	42
16/1			30.5	540	9.2	4.0/5.2			
	Balance studies (prednisone) 5 mg. q.i.d.								
20/1	5.6	7.1	28.2	520	9.4	4.4/5.0	3	74	58
23/1			20.5	500	8.5	4.0/4.5			
25/1				520	8.7	4.1/4.6			
27/1	3.5	4.4	19.0	450	8.7	4.6/4.1	3	95	40
30/1			19.2	470	8.9	4.7/4.2			
1/2				460	9.0	4.7/4.3			
3/2	3.2	4.0		460	8.3	4.7/3.6	2	53	52
6/2				490	8.7	4.6/4.1			
7/2			19.0						
8/2				500	8.7	5.2/3.5			
10/2	2.6	3.6	18.3	470	8.2	4.9/3.3	1	35	32
13/2			18.0	500	8.6	4.9/3.7			
15/2				550	8.0	5.0/3.0			
17/2	2.2	2.7	17.5	510	8.3	5.0/3.3	0	34	64
20/2			18.0	500	9.5	4.7/4.7			
23/2	1.7	2.4	15.6	460	8.3	4.9/3.4	0	62	38
	End of balance studies								
2/3	1.4	1.8	15.5	318	7.5	4.5/3.0	1	27	32
22/5	2.3	3.0	20.0	370	8.6	4.1/4.5	0	56	76
24/7	1.6	2.0	16.7	325	8.7	4.4/4.3	0	29	75
25/9	2.2	2.7	20.0	400	8.3	3.9/4.4	0	23	80
20/11	3.4	4.8	22.8	300	8.3	4.1/4.2	0	26	77
1957									
8/1	5.0	6.5	28.6	480	9.6	4.3/5.3	2	50	86
8/3			49.0						
15/3	5.0	6.9		650					

TABLE II.—*(Continued)*

Date	Serum bilirubin Direct (mg.%)	Serum bilirubin Total (mg.%)	Serum phospholipid (mg.P.%)	Serum cholesterol (mg.%)	Serum proteins total, alb./glob. (g.%)	Cephalin-cholesterol flocculation	Thymol turbidity (units)	Serum alkaline phosphatase (K.A. units)
3/5	5.5	7.0			9.5 4.3/5.2	4	198	69
2/7	5.8	8.0		1220	9.6 3.7/5.9	2	142	66
6/9	3.5	4.7	71.0	960	9.2 3.8/5.4	1	112	
26/11	4.6	5.8			7.6 3.1/4.5		48	26
1958								
21/1	3.5	4.3				3	17	65
29/4	5.4	7.2			9.5 4.8/4.7	1	28	54
26/8	5.1	6.7	76.3	960	9.3 4.4/4.9	3	56	75

and thymol turbidity values and the albumin/globulin ratio also improved. The patient developed diabetes mellitus with blood sugar levels ranging from 150-200 mg. % in the fasting state and from 270-400 mg. % two hours postprandially. Cortisone had been discontinued gradually during the month prior to the diagnosis of diabetes. Blood sugar levels remained abnormal after cortisone had been stopped and were controlled with 15 units NPH insulin daily. After cessation of cortisone therapy, his sense of well-being and appetite deteriorated and all the values from liver function tests became more abnormal, as shown in Fig. 3.

Two other interesting clinical findings were noted. One was a flitting arthritis with pain and swelling of small joints of the limbs and of tendons close to the large joints; this had been present intermittently since 1952. The other finding was a neurological lesion. He had noticed some clumsiness of his left foot early in 1954 and transient diplopia at the time of admission. There was atrophy of the left scapular and left thigh muscles and corresponding left-sided muscle weakness. Temperature and pain sensation were lost in the cervical dermatomes on the left and diminished over the entire right side below this level. Loss of vibration sense was noted over the entire body except the left forearm. Joint position sense was impaired in the fingers and toes bilaterally. Signs were present suggesting involvement at a supraspinal level. Tendon reflexes were increased in both left extremities and the left plantar response was less flexor than the right. The cerebrospinal fluid was clear and colourless and contained one lymphocyte/c.mm. and 35 mg. % protein. A colloidal gold curve was 3211000000. Kolmer complement fixation test was negative.

The patient was admitted to hospital twice during the winter of 1954-55. The liver size did not change but the spleen became palpable at the left costal margin. Jaundice persisted, and as seen in Fig. 3, little change occurred in the values from liver function tests. Insulin was discontinued in November 1954 and fasting blood sugar levels remained normal. An exploratory laparotomy was performed in April 1955. No evidence of extrahepatic disease was found and operative cholangiography revealed no abnormalities. The liver was somewhat enlarged, red-brown, moderately firm and smooth, and its edge was rounded. The cut surface, at the time of surgical biopsy, was decribed as yellowish and homogeneous without normal lobular pattern. The spleen was grossly enlarged and firm. Histological examination showed slight increase of portal fibrous tissue with mononuclear infiltration and tongue-like projections of fibrous tissue and mononuclear cells into the parenchyma. Parenchymal cells were normal and minimal evidence of bile stasis was found. The changes were characteristic of primary biliary cirrhosis. His weight increased from 160 lb. in November 1954 to 190-195 lb. in April 1955, but with no increase in sense of well-being during this time. During the same period the serum bilirubin, alkaline phosphatase, thymol turbidity and serum globulin levels continued to be markedly elevated and the levels of serum cholesterol and serum phospholipid became grossly elevated (Fig. 3).

In January 1956, when he was admitted to the clinical investigation unit for nitrogen balance studies, the patient weighed 195 lb. and was slightly icteric. Minimal acne of the chest and back was noted. The round, moderately firm, slightly tender liver edge was palpable at 7 cm. below the right costal margin, and the surface was smooth; spleen was just palpable at the left costal margin. "Liver palms" and small hæmorrhoids were present. During a control period of 15 days he received a constant diet of 1818 calories, composed of carbohydrate 267.5 g., fat 39 g., protein 99 g., nitrogen 15.9 g., and a fluid intake of 3190 c.c. In addition, he was given vitamins B and K. Minimal activity was permitted. After the control period, 5 mg. prednisone (Meticorten, Schering) was administered four times daily over a 37-day period from January 19 to February 25, 1956. An immediate and persistent increase in his sense of well-being and appetite resulted, despite the loss of 15 lb. during this period. Blood sugar levels remained within normal limits and no evidence of sodium retention was detected clinically. The results of laboratory tests are shown in Table II and Fig. 4. Results of other serial determinations include: non-protein nitrogen 24-36 mg. %, blood urea nitrogen 15.0-18.6 mg. %, serum calcium 9.0-10.8 mg. %, serum phosphorus 2.3-4.3 mg. %, hæmoglobin 73-99%, total white blood cell count 10,200-16,100 per c.mm. and prothrombin activity 87-100% of normal.

Towards the end of the study period he suffered from frequent belching but no evidence of peptic ulcer disease was found. Subjective and biochemical improvement continued after resumption of increased activity. The balance studies were concluded on February 23, and during the next two weeks, with increased caloric intake, his weight increased from 174 to 186 lb. He was discharged on March 2, 1956, and continued to take prednisone 2.5 mg. four times daily. The previously described arthritic and rheumatic symptoms continued to be troublesome at times and the neurological findings persisted.

During the first eight months after discharge, the patient felt quite well, and laboratory tests, shown in Table II and Fig. 3, were essentially unchanged. In March 1956, one month after the end of the balance study, xanthelasma was noted at the medial canthus

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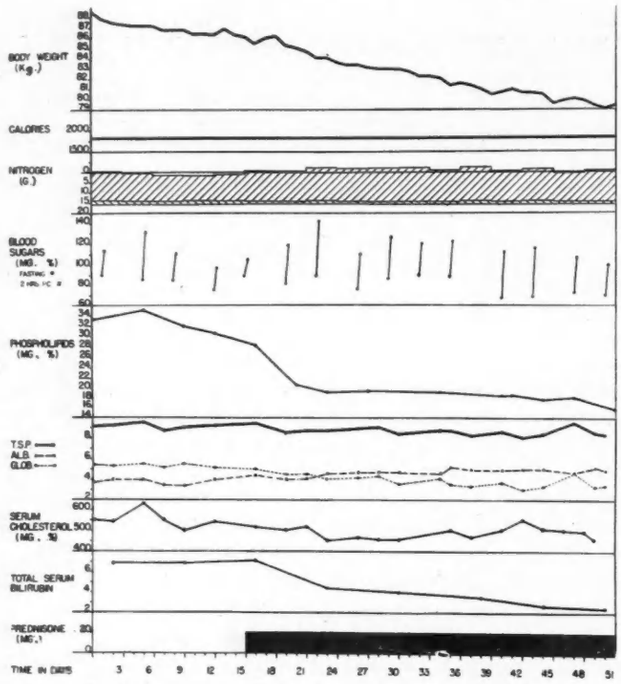

Fig. 4.—Case 2, J.A.L. Results of serial laboratory tests carried out during nitrogen balance studies from January 4 to February 25, 1956.

of the right eye. The serum cholesterol value at this time was 318 mg. % and serum phospholipid was 15.5 mg. P %. On April 12, 1956, xanthomatous deposits were first noted in the interdigital clefts of the fingers.

In September 1956, he complained of a cough and of pain in the left lower axilla. A slight fever was present and a pleural friction rub heard over the lower left axilla. The discharge diagnosis was unexplained pleurisy. An exacerbation of joint and tendon symptoms led to readmission in March 1957. Pain, stiffness, swelling, and tenderness of joints and periarticular tissues subsided on bed rest. The neurological signs were unchanged and considered by two neurologists to be compatible with a diagnosis of disseminated sclerosis. Levels of serum bilirubin and serum proteins were more abnormal than previously and a considerable rise in the levels of serum phospholipid and cholesterol was found (Fig. 3).

In May 1957, prednisone dosage was increased to 15 mg. daily. He felt well except for occasional episodes of slight malaise. However, he began to complain of polyuria and an increased thirst and was found to have fasting blood sugar levels above 200 mg. %. The prednisone was decreased to 10 mg. a day and the patient was admitted for diabetic control. Liver size was unchanged and the spleen was palpable three cm. below the left costal margin. As shown in Table II and Fig. 3, the serum cholesterol measured over 1200 mg. % and serum phospholipid was 71 mg. P %. A large xanthomatous deposit was noted overlying the left olecranon. Hyperglycæmia was controlled with insulin; the dosage was increased slowly up to 150 units a day and then lowered over a seven-week period until none was required at the time of discharge.

In November 1957, he was admitted for treatment of bilateral bronchopneumonia which was followed by prolonged illness from pharyngitis, sinusitis and otitis media. Insulin was necessary during the febrile period but not at the time of discharge in February 1958. In April 1958, he gave a history of mild epigastric pain at bed-time for two weeks, partly relieved by milk; then, two days of left lower quadrant pain followed by several black bowel movements. He was admitted to hospital with a hæmoglobin of 55%. No new physical findings and no abnormalities on radiological investigation of the gastro-intestinal tract were found. Weight was 165 lb. After a transfusion of 500 c.c. blood and iron therapy, the hæmoglobin level climbed steadily.

Except for increased fatigability and episodes of anorexia, he felt well from April until October 1958, when a fasting blood sugar of 256 mg. % was found and the patient was readmitted. Fasting blood sugar levels were well controlled with 30 units NPH insulin daily. Weight was 166 lb. Xanthomatous deposits at the sites previously described were unchanged and in addition multiple, flat, creamy, pin-head sized intracutaneous lesions were overlying the upper part of the buttocks. Liver and spleen sizes were unchanged. Neurological examination revealed slight wasting of the left upper limb and moderate wasting of the left leg, with slight weakness of the entire left side of the body. Decreased sensation to temperature and pinprick was found over the entire right side of the body. Position sense was poor in both hands and feet, especially the right. Sensation was decreased to pinprick and temperature over dermatomes C2-4 bilaterally, more marked on the left. The sense of touch was intact. Inability to carry out fine movements with the right hand was prominent. Tendon reflexes were increased in both left limbs and the left plantar response was upgoing. Thus neurological signs were not appreciably changed though there was some subjective deterioration. A serum copper determination on April 21, 1958, was 30.4 mg. % as ceruloplasmin (normal 15-35 mg. %).

The clinical, laboratory and histological findings are considered to be those of primary biliary cirrhosis and an as yet unexplained neurological lesion thought to be either disseminated sclerosis or syringomyelia. The possibility that the neurological findings are related to the hepatic disease deserves consideration.

DISCUSSION

Primary biliary cirrhosis is a chronic progressive disease of insidious onset, characterized by remissions and exacerbations of symptoms, signs and laboratory findings. Although the disease is much more common in females, several authors have reported classical cases occurring in males.[15, 18, 19] The two patients in the present study possessed the clinical, laboratory and histological criteria necessary for the diagnosis of this disease.[15, 18] In one patient, the significance of an associated neurological disease is as yet unexplained. Histological findings of liver tissue in both patients were those seen in primary biliary cirrhosis. One patient at death showed the histological features of postnecrotic portal cirrhosis, a sequel which is described by Ahrens *et al.*,[15] Anderson[16] and MacMahon.[17] In recent years infectious hepatitis[17, 20] and hepatitis caused by drugs such as chlorpromazine[19] and arsenicals[15] have been incriminated in the etiology of primary biliary cirrhosis, but the cause of most cases remains an enigma. No history of exposure to hepatotoxic agents could be elicited from either patient. In each a previous diagnosis of "hepatitis" had been made elsewhere.

In both patients, but especially the second, there were marked fluctuations in the laboratory findings. These fluctuations during the natural course of the disease have been observed by others.[15, 21] Because of the naturally fluctuating course of primary biliary cirrhosis and the ineffectiveness of therapeutic measures to alter the course of the disease,[15, 21] which in the series of Ahrens *et al.*[15] resulted in death within seven years in one-third of the cases, it is essential to assess any projected therapy over a sufficiently long period of time. In the present study, the first patient was observed for a year, the second for more than five years. In the first patient prednisone therapy was maintained for eight months and in the second for nearly three years. The following observations have been made concerning the effects of prednisone on these two patients.

(a) *Effects of Prednisone on Clinical Status*

Before beginning steroid therapy, both patients had persistent malaise, anorexia, slight or no weight loss, and slight to moderate mood depression. The restricted diet and activity of the control period of the balance study produced no change, except that the second patient began to lose weight.

In the first patient after cortisone therapy was begun, appetite and sense of well-being increased immediately though he remained somewhat sullen and complaining. About a week later he became more cheerful and energetic. The second patient also developed an increase in appetite and sense of well-being when prednisone therapy was begun, similar to that which had occurred 21 months earlier when cortisone was given. The improved mood, energy and appetite persisted for eight months in the first patient and for almost three years in the second patient. During the summer of 1958 (2½ years after the initiation of prednisone therapy and while still receiving 10 mg. daily) the second patient began to have mild, transient episodes of anorexia and increased fatigability.

This general symptomatic improvement has also been observed by Carman and Giansiracusa,[22] who used ACTH and hydrocortisone in the treatment of primary biliary cirrhosis.

(b) *Effects of Prednisone on Laboratory Findings*

1. *Nitrogen balance.*—As shown in Figs. 2 and 4, a slightly negative nitrogen balance followed the start of steroid therapy in each patient. In the first patient, this was slightly greater with cortisone 200 mg. daily than with prednisone 20 mg. daily. Associated with the negative nitrogen balance was weight loss in both cases. In the second patient, the weight loss which began with the institution of a reduced caloric intake for the control period was accelerated when prednisone therapy was started. In studies of the comparative effects of prednisone, cortisone and hydrocortisone in patients with rheumatoid arthritis, Rosen *et al.*[23] observed in the case of prednisone a negative nitrogen balance which was greater than that obtained by the use of comparable doses of either cortisone or hydrocortisone. Thorn *et al.*[24] in describing the negative nitrogen balance caused by cortisone and hydrocortisone, indicate that this can be diminished by increased dietary intake.

2. *Serum electrolytes.*—Levels of serum sodium, potassium, chloride, bicarbonate, calcium and phosphorus during prednisone administration were not significantly changed. The first patient developed minimal ankle œdema and "moon face" when cortisone was changed to prednisone therapy and later developed slight ankle œdema and ascites. It was impossible to determine whether this fluid retention was associated with his disease or due to steroid therapy.

3. *Serum proteins.*—Several investigators[23, 25, 26] have reported the effects of steroids in general and prednisone in particular on serum proteins and the albumin-globulin ratio in portal cirrhosis[26] and other diseases. The observed effect in some cases is to raise an abnormally low albumin towards normal and to lower the serum globulin level. In the present study, both patients showed abnormally high serum globulin with low serum albumin levels though the latter were close to the normal range. During the period of administration of steroids, the level of serum globulin in both patients fell to almost normal and serum albumin levels rose slightly. In the first patient, this change persisted for six months, after which time the serum globulin again increased. In the second, the level of serum globulin rose again within a few months of the termination of the balance study and remained elevated despite continuous prednisone therapy. This patient had also shown a fall of the serum globulin level to normal during a six-month period of cortisone administration in 1953-54.

4. *Cephalin-cholesterol flocculation and thymol turbidity.*—The first patient showed no significant changes in the cephalin-cholesterol flocculation or thymol turbidity tests during the balance study or during subsequent administration of prednisone. In the second patient, there was a definite decrease in the value for cephalin-cholesterol flocculation during the administration of prednisone and a gradual decline in thymol turbidity values. These changes had also occurred during the previous course of cortisone administration. One year after the balance study was completed, both of these tests again became grossly abnormal despite continued prednisone administration.

5. *Serum cholesterol and phospholipids.*—A marked elevation of serum lipids and particularly of serum phospholipids is a characteristic feature of primary biliary cirrhosis.[15,18] Carman and Giansiracusa[22] demonstrated a fall in the level of serum phospholipids during adrenal steroid administration. In the present study, both patients showed a fall in serum phospholipid levels probably unrelated to

steroid therapy. In the first patient, a prolonged, gradual fall in serum phospholipids occurred during the six weeks before the start of steroid therapy and the level then remained low for the next seven months. In the second patient, a decline in the level of serum phospholipids began weeks before the administration of prednisone was begun. The gradual fall continued during the balance study period. About a year after the end of the balance study, while the patient was still taking prednisone, the serum phospholipids began to increase and climbed to very high levels, which have persisted. In both patients, the level of serum cholesterol roughly paralleled that of the serum phospholipids, though in the first the serum cholesterol level increased significantly during the administration of cortisone. The changes in lipid levels in these patients do not appear to be related to steroid therapy, but rather, to the natural course of the disease.

A late manifestation of primary biliary cirrhosis is the appearance of xanthomatous deposits. Ahrens *et al.*[15] have concluded that xanthelasma occurs in patients with total serum lipids of 1300-1800 mg. %, and that generalized xanthomatous deposits appear when the level exceeds 1800 mg. %. It is of interest to note that in both patients xanthelasma appeared only after the serum phospholipid levels had fallen to low levels and that xanthomatous deposits were first seen while the serum cholesterol and serum phospholipid levels persisted at much lower levels than the maximum levels demonstrated. The second patient developed more and larger xanthomatous deposits after the phospholipid and cholesterol levels had again risen.

6. *Serum bilirubin.*—Thorn *et al.*[24] administered ACTH to a patient with biliary cirrhosis and demonstrated a consistent fall in serum bilirubin. Serum bilirubin levels in the first patient fell slightly during the control period of the balance study, and again declined slightly during the administration of cortisone and prednisone. One month after the end of the balance study period, though prednisone therapy was maintained, the levels of serum bilirubin rose and remained high. The second patient showed a marked fall in the level of serum bilirubin immediately after the start of therapy with prednisone, but during the next seven months there was a gradual rise to the previous high levels. The higher levels persisted, with some fluctuation, for almost three years though prednisone has been taken continuously during that time. It is of interest that a slight fall in serum bilirubin levels occurred during cortisone therapy, 21 months before the balance study. If the changes in serum bilirubin levels in the second patient were brought about by prednisone therapy, it would seem necessary to postulate that this effect later became exhausted. On the other hand, the changes could be considered a part of the natural course of the disease.

7. *Serum alkaline phosphatase.*—No changes in serum alkaline phosphatase levels attributable to steroid therapy were seen in either patient. This is in contrast to the striking reduction of alkaline phosphatase noted in one patient with primary biliary cirrhosis when treated with hydrocortisone by Carman and Giansiracusa.[22]

(c) *Toxicity*

1. *Diabetes mellitus.*—The first patient had abnormally high blood sugar levels postprandially while receiving cortisone, but these levels became normal when he was given prednisone. Twenty-one months before the balance study, the second patient had developed diabetes after receiving 200 mg. cortisone daily for six months and required insulin for control. He developed diabetes mellitus again after 19 months of continuous prednisone therapy and required insulin for a short time. Insulin was also necessary five months later when he developed pneumonia, and again in October 1958 when hyperglycæmia was present. It is significant that the patient's mother was known to have diabetes.

2. *Peptic ulceration.*—It has been suggested that peptic ulceration is more common with prednisone than with cortisone.[27] On the other hand, Meltzer *et al.*[28] in reviewing the incidence of peptic ulcer among patients on long-term prednisone therapy have concluded that prednisone is not ulcerogenic. Sherlock[29] states that the incidence of peptic ulcer disease is high in patients with primary biliary cirrhosis. In our patients, no evidence of peptic ulceration was present clinically or radiologically, but the second patient had a single, massive, upper gastro-intestinal hæmorrhage, the cause of which could not be determined radiologically.

SUMMARY AND CONCLUSIONS

Two patients with primary biliary cirrhosis have been studied clinically and by serial laboratory determinations, one for a period of one year and the other for five years. Nitrogen balance studies were carried out during the control periods and during the periods of administration of cortisone and prednisone in one patient for 33 days and of prednisone in the other for 37 days.

Appetite and a sense of well-being increased in both patients. This improvement persisted for eight months in one patient and for almost three years in the other. One patient developed ankle œdema and ascites. This could be considered a manifestation of his disease or of steroid administration or both. The patient with a family history of diabetes mellitus developed hyperglycæmia which required insulin. He also had a massive gastro-intestinal hæmorrhage, the source of which could not be determined.

During the balance studies and subsequently, while the patients were receiving prednisone, certain laboratory changes were noted: (a) A slightly negative nitrogen balance occurred in both patients during treatment with prednisone while they were on a restricted caloric intake. (b) Serum electrolytes did not change significantly during prednisone therapy. (c) Abnormally high serum globulin levels fell and serum albumin levels rose slightly in both patients during the balance studies, but became abnormal again a few months later while the patients were still receiving the steroid.

Prednisone seemed to have affected these laboratory findings significantly, though transiently. (d) The cephalin-cholesterol flocculation and thymol turbidity tests became normal in one patient, but subsequently became abnormal about one year after the completion of the balance studies. These tests did not change significantly in the other patient. (e) Serum alkaline phosphatase values did not change significantly in either patient. (f) In one patient, no change in the serum bilirubin level could be attributed to prednisone therapy. In the other, the serum bilirubin levels fell to near normal during the balance study period but rose again to high levels about seven months later and have continued to be high and fluctuating in spite of continuous prednisone therapy. In this patient the administration of prednisone appears to have had a transient effect on serum bilirubin level. (g) In both patients, the abnormally high levels of serum phospholipid and serum cholesterol were falling before prednisone therapy was instituted, remained low during the balance studies, and subsequently rose to very high levels in the second patient—despite continued prednisone therapy. These changes are felt to be unrelated to steroid therapy.

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RÉSUMÉ

Les auteurs ont gardé sous observation pendant plusieurs mois deux malades atteints de cirrhose biliaire primaire. L'un reçut de la cortisone et de la prednisone pendant 33 jours et l'autre, de la prednisone seulement, pendant 37 jours. On établit leur bilan azoté avant et pendant la thérapie.

Le médicament stimula l'appétit et créa une sensation de bien-être chez les deux malades. L'amélioration dura huit mois chez l'un et presque trois ans chez l'autre. L'un des deux fit de l'œdème des malléoles et de l'ascite dont la cause put être imputable soit à l'administration de stéroïdes ou soit à l'état de son foie. L'autre malade qui avait des antécédents familiaux de diabète fit une hyperglycémie qu'on dut traiter à l'insuline. Il eut aussi une hémorragie gastro-intestinale massive dont la source ne put être précisée.

On nota certaines variations biochimiques au cours de la thérapie et de la période-témoin d'observation qui la précéda. Les voici dans leurs grandes lignes:

Les deux malades entrèrent en déficit azoté pendant qu'ils recevaient de la prednisone et alors que leur apport calorique était diminué.

Les électrolytes du sérum ne subirent aucun changement pendant la thérapie.

La prednisone semble avoir contribué à un abaissement du titre trop élevé des globulines et à un léger relèvement de celui des albumines vers la normale mais seulement d'une manière transitoire.

Les épreuves de floculation de la céphaline-cholestérol et de la turbidité du thymol redevinrent normales pendant à peu près un an chez l'un alors qu'elles n'accusaient aucun changement de quelque importance chez l'autre.

L'activité de la phosphatase alcaline du sérum ne subit aucun changement ni chez l'un ni chez l'autre.

Dans un cas on ne put rattacher à la thérapie aucun changement dans le taux sérique de la bilirubine. Dans l'autre, après une descente au niveau normal pendant la thérapie, la bilirubine a remonté malgré le traitement, après environ sept mois, et a oscillé par la suite entre des taux élevés. La prednisone aurait eu une action transitoire dans ce cas.

Les taux élevés de phospholipides et de cholestérol sériques avaient déjà commencé à baisser avant le début du traitement. Ils ont remonté plus tard pour atteindre dans un cas des niveaux fort élevés et ce, malgré la prednisone. Ces changements ne semblent pas se rapporter à la thérapie aux stéroïdes.

LUNG VOLUME IN SMOKERS AND NONSMOKERS

Anatomical lung compartments were measured by Blackburn, Brozek and Taylor (*Ann. Int. Med.*, 51: 68, 1959) in a group of 221 middle-aged men (mean age 52 years) and mean values were compared for subgroups of cigarette smokers and nonsmokers. Age and body size were eliminated as variables. Vital capacity was smaller in each category of smokers. The difference from nonsmokers reached a statistically significant level for all smoking categories combined. Residual lung volume was larger in all categories of smokers, but not consistently at significant levels statistically. Total lung capacity was not significantly different between groups. The ratio of residual volume to total lung capacity (RV/TLC $\times$ 100) was significantly greater in smokers. In a group which had successfully stopped all smoking (on the basis of two annual interviews), the lung compartment values were similar to those of a group who had never smoked, and the ratio of residual volume to total lung capacity was significantly smaller than in the current smokers. Stringent screening of this sample for abnormal respiratory manifestations left a residual 188 men in whom the same order of differences in lung volume prevailed between smokers and nonsmokers as in the total sample. The prevalence of an "elevated" ($>35\%$) residual volume/total lung capacity ratio was significantly greater in smokers. Differences in vital capacity, residual volume and the ratio of residual volume to total lung capacity were in the direction to be expected if smoking is a factor in producing a functional increase of airway resistance. These findings are comparable to the differences in lung volumes found by previous workers in a population examined with reference to the smoking habit.

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A METHOD FOR THE ACCURATE PLACEMENT OF CHEST ELECTRODES IN THE TAKING OF SERIAL ELECTROCARDIOGRAPHIC TRACINGS*

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ONE OF THE SKELETONS in the family closet of electrocardiography, alluded to briefly[1, 2] if at all, is the fact that the selection of exactly the same sites for the placement of chest electrodes in serial tracings is rarely achieved even where reasonable care is employed. The importance of this aspect of technique depends on how large a variation in placement of the exploring electrode can be tolerated without causing an alteration in the form of the ventricular complex that might be misinterpreted as a change in the state of the myocardium. Experienced electrocardiographers allow for this variable in the interpretation of serial tracings, but even they may at times be in doubt whether the differences are pathologically significant or merely technical. With the inexperienced and often enthusiastic interpreter the possibility of such error is even greater.

The suggestions of the Committee on Electrocardiography of the American Heart Association[3] for the placement of precordial leads have been widely adopted. Obviously the anatomical relationship of any landmarks on the chest to a particular area of the myocardium differs greatly from individual to individual,[4] which partly accounts for the fact that a variety of QRS-T configurations in a given chest lead may be accepted as normal. The directions of the committee[3] for the placement of precordial leads were not exact nor could they be expected to be. The C1 and C2 locations are relatively easy to select because of their close relations to bony landmarks; however, the selection of a perpendicular line from the middle of the clavicle and of anterior and mid-axillary lines is by no means as simple as it seems. Originally a similar committee[5] recommended that to find the fourth position a horizontal line should be drawn from the left sternal margin in the 4th interspace to the outer border of the apex beat or to the junction of mid-clavicular line with the 5th interspace, alternatives which might make a considerable difference in some individuals. Subsequently only the junction of the midclavicular line and the horizontal line was designated as the fourth position.[3] Nonetheless, a recent technical bulletin[6] has perpetuated the confusion.

Although the directions of the committee[3] are generally regarded as satisfactory for use in routine electrocardiography, it is obvious that with the aid of these alone one cannot find the same site repeatedly with any great degree of accuracy. Casual inspection of the literature reveals numerous examples of serial electrocardiographic changes interpreted as alterations in the state of the myocardium. In many cases, insufficient consideration has been given to the possibility that the differences were due only to variations in the position of the exploring electrode. It is recognized that in certain areas of the chest, notably around the C3 position, slight variations in electrode position may result in marked changes in the form of the complex.[7] It is less often appreciated that variations may be found at other chest positions, particularly in abnormal electrocardiograms. Little investigation of this problem appears to have been undertaken; however, recently August, Mazzeleni and Wolff[8] have emphasized that QRS-T changes simulating infarction may be caused by slight shifts of the exploring electrode.

PRELIMINARY INVESTIGATION

In the planning of studies on the frequency spectrum of cardiac potentials, it quickly became evident that if serial alterations in the QRS-T complex, particularly those changes detectable only by apparatus capable of registering high-frequency potentials,[9] were to be attributed to changes in electrophysiology, it was essential to be able to place the exploring electrode on exactly the same site whenever required. Only if this were possible could one be assured that serial tracings taken at intervals of days, weeks, or even years would be comparable in this respect.

It was first considered of interest to determine the range of variation in the placement of electrodes produced by trained and alert technicians, aware of the nature of the investigation and therefore presumably anxious to do their best. In a number of subjects, several technicians marked on the chest the standard positions (C1 to C6) on two to four occasions over a period of several days. The locations marked were recorded by one of us (I.R.M.) by means of the grid system to be described below. A comparison of the results showed that in male subjects the same position (within 1 cm.) could be selected in only 40 to 50% of trials. In female subjects, for an obvious reason, even fewer successes were achieved (15 to 20%). The magnitude of error was often of the order of 2-3 cm. in both horizontal and vertical directions, and occasionally reached as much as 6 cm. Because of the more easily selected bony landmarks, the errors in the C1 and C2 positions were relatively small, but in the left chest positions the variations were much larger. Although the differences between technicians were often great, day-to-day variations even by the same technicians were surprisingly large.

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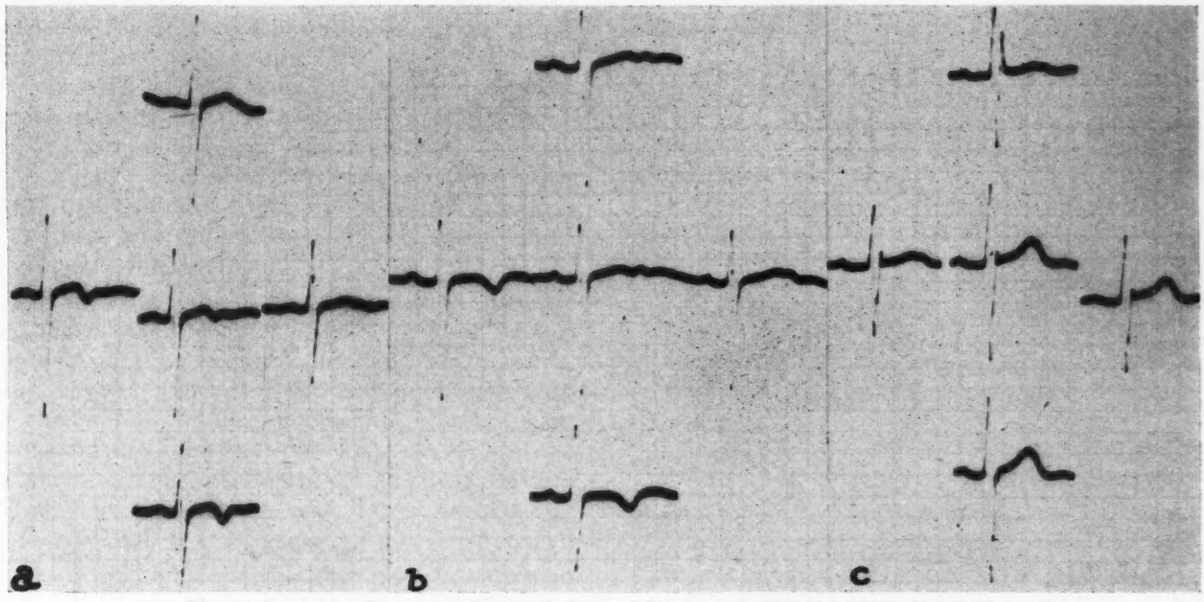

Fig. 1.—In a, b and c respectively, V2, V3 and V4 are surrounded by complexes taken 2 cm. above, below, medial to and lateral to each. In a and b the changes involve chiefly the T wave, and in c, chiefly the QRS. All three examples were taken from normal subjects. Time and height lines have been removed.

It was then necessary to study the effect of such differences in electrode placement on the form of the QRS-T complex. Electrocardiograms were taken at V2, V3, V4 and V5 positions and also at a distance of 2 cm. above, below, medial to and lateral to each of these positions. This distance (2 cm.) was somewhat less than the average difference encountered in the trials mentioned above. The Welsh suction cup electrode was used. It has been shown and we have confirmed that no difference in the form of the QRS-T complex exists whether the large or small cup is used. In this case the small cup was employed because it was easier to centre on the chest marking.

Twenty-three subjects without known cardiac disease were investigated. At the V2 position in only three subjects and at the V5 position in only six subjects were there no variations in the form of the complexes. In all other subjects and in all other positions differences existed in either all or some parts of the complex as a result of moving the electrode 2 cm. in one or other direction (Fig. 1). Many of the changes were of no clinical significance in these normal persons and would readily be recognized by trained observers as due to electrode placement variation. Nevertheless, in certain cases T wave changes were encountered which might be falsely attributed to myocardial ischæmia or in serial records might be considered to indicate a lesion—merely because of the difference in electrode position. In Figs. 1a and 1b the presence of T wave notching and negativity depended wholly

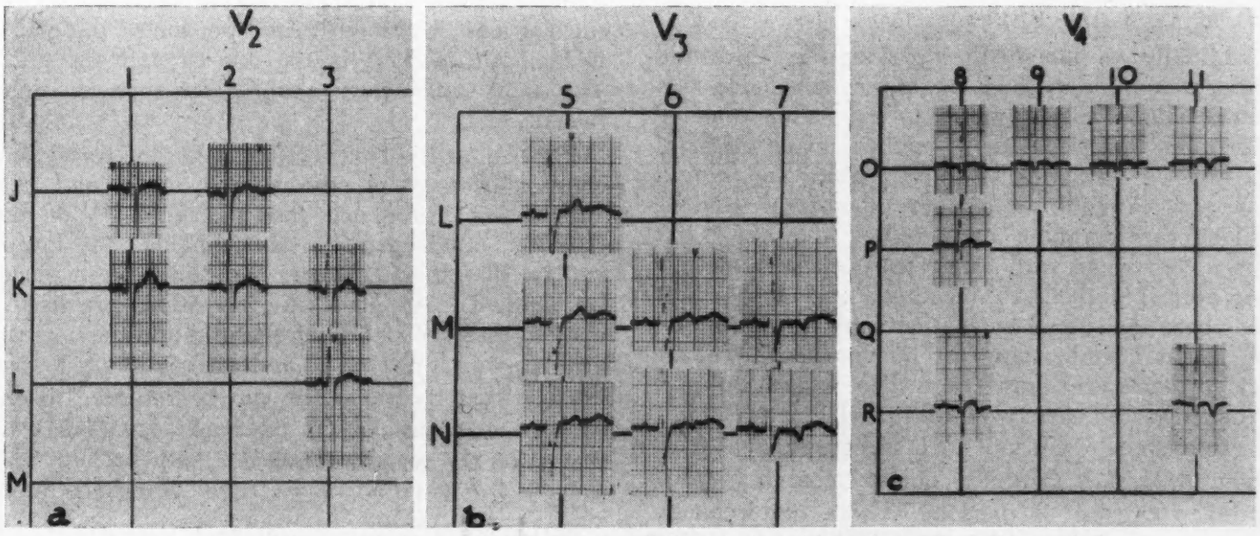

Fig. 2.—In a, b and c are shown examples of the actual positions chosen by various technicians at V2, V3 and V4 respectively. These complexes have been placed at line-crossings on the grid just where the electrodes were placed. The grid lines are actually 1 cm. apart but the grid has been enlarged for convenience in mounting. The variations in ST and T wave appearance would be noteworthy if the records had been serial ones.

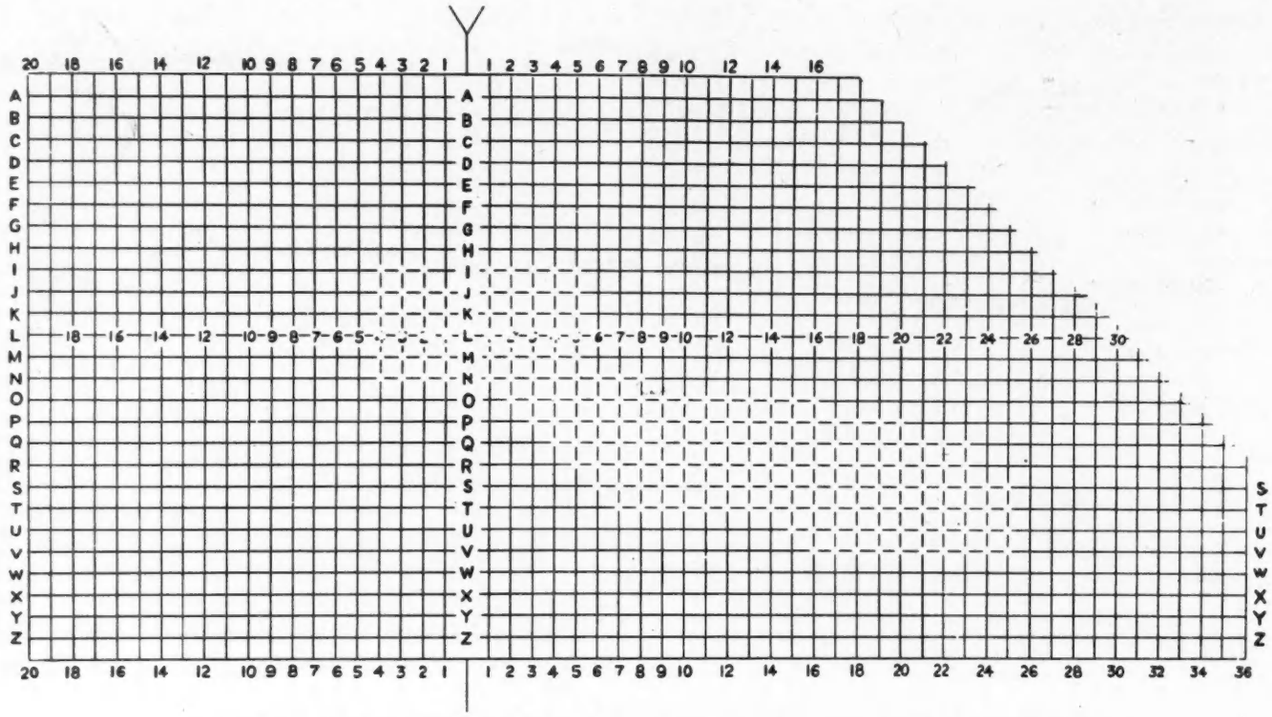

Fig. 3.—Grid (much reduced for illustration) measures 60 x 34 cm. The left upper portion has been cut out so that it can be wrapped around the left chest. The grid lines are actually 1 cm. apart. The horizontal lines are lettered and the vertical lines numbered on each side of the midline. The most frequently used line-crossings are punched out to facilitate chest marking (see text).

on where the electrode was placed. Similarly the QRS complex was sometimes altered. In Fig. 1c the upper complex, 2 cm. above the V2 position, might be interpreted by some as incomplete right bundle branch block (RBBB). Fig. 2 indicates the differences in the complexes in V2, V3 and V4 at various sites actually chosen by several technicians. It is quite clear that for certain purposes, particularly for exact replacement of the exploring chest electrode, a method more accurate than any heretofore available is needed.

MATERIAL AND METHODS

Initially we thought that marking the skin would offer a suitable method, but it was concluded that chemicals sufficiently potent to leave a mark lasting for more than a day or so might damage the skin, would be æsthetically objectionable, and would in any case be useless for long-term studies. Electrocardiographic mapping of the chest has been carried out with a different purpose in mind.[10] An optical method of projecting a grid on the chest has been developed by Mathewson[11] but it seemed to be too cumbersome for our purpose. We decided that a grid drawn on a sheet which could be applied to the chest would be satisfactory. The desirable characteristics of such sheeting appeared to be transparency, flexibility, non-stretchability, durability and ease of marking. These requirements were best met by a material called Perfectrace. A sheet (Fig. 3) measuring 60 x 34 cm. was found to be sufficiently large to reach from one axilla to the other and from the sternal notch to the epigastrium. From a master, the grid was printed on the Perfectrace sheets by the silk screen process. These sheets eventually cracked with usage but were inexpensive and replaced as needed. The grid lines were placed 1 cm. apart because lines closer together were difficult to follow and the accuracy of placement was not greatly increased. Because of their fewer number, the horizontal lines were designated by letters printed in place of the midline and at the lateral margins. The vertical lines were numbered on each side from the midline. Small holes were punched at each line-crossing (at least in the most used portion of the grid) to facilitate marking of the skin through the grid. The most satisfactory skin-marker was eyebrow pencil.

For use on the front of the chest, the technique consists of marking the sternal notch and the xiphoid with the pencil, then placing the V of the "midline" of the grid on this point and the lower end on the xiphoid, having the grid held in place by hand. The standard chest positions previously marked then show through the grid and the nearest grid-crossing is re-marked and recorded (e.g. V3 = M9) so that the same site can be returned to on subsequent occasions. On the back, the V mark is placed on the seventh cervical spine.

RESULTS

To test the accuracy of this grid method of electrode placement, one of us (I.R.M.) marked

in red ink the C1 to C6 positions in the usual manner. The corresponding grid positions were then recorded and on four subsequent occasions on each patient the C1 to C6 electrode positions were again marked in red ink using the grid reading originally obtained. Red glasses were worn during the re-markings so that the previous red ink marks could not be seen and therefore could not influence the results.

Four men and eight women were so studied, care being taken to include among the females three with very large breasts, under which circumstance electrode placement is always a difficult task. The maximum variation in electrode positioning in the men in the C1 to C5 positions was 0.7 cm. In one man with a large emphysematous chest the maximum variation at C6 was 1.4 cm. and in the other three men it was 1.0 cm. In five women with breasts of average size, the maximum variation in the C1 to C5 positions was 1.0 cm. and at C6 was 2.0 cm. In three women with very large breasts, the maximum variation in the C1 to C3 positions was 1.0 cm., at C4 it was 1.5 cm. and at C5 and C6 it was 3.0 cm.

The results from using this grid were better than we had anticipated. In general one can conclude that in most patients the use of the grid method of recording and re-selecting chest electrode positions enables one to return to the same site with an error often less than 1.0 cm. and usually not greater than 2.0 cm. This method could be adopted in routine electrocardiography with beneficial results, but it does require a little more time and trouble than the average technician may be willing to take. For certain purposes, particularly in research, it appears to be reasonably accurate and simple.

SUMMARY

Attention has been drawn to the inadequacy of the usual procedure for the selection of the standard precordial electrode positions, particularly when serial electrocardiograms are needed. Considerable differences in the form of the QRS-T complex due to slight shifts in electrode position have been demonstrated in some cases. Large variations in the actual placement of chest electrodes by several technicians and on repeated attempts by the same technician have been shown. A grid method for marking and recording chest positions has been developed, by means of which it is possible to return to the same site with an error usually less than 1.0 cm. and seldom exceeding 2.0 cm.

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RÉSUMÉ

Les auteurs attirent l'attention sur l'inefficacité de la méthode courante de déterminer l'emplacement de l'électrode exploratrice des dérivations précordiales surtout lorsqu'il s'agit d'établir plusieurs tracés successifs pour fins de comparaison. Un léger décalage dans la position sur la poitrine d'une électrode, entre deux tracés, peut causer une différence considérable dans la configuration du complexe QRS-T (comme on l'a démontré dans certains cas). La détermination des points précordiaux varie d'une technicienne à l'autre et même d'une fois à l'autre chez la même technicienne. Les auteurs ont inventé un quadrillage qui permet de déterminer l'emplacement d'une électrode, d'en prendre note et de replacer cette électrode ultérieurement avec une erreur en général de moins de 1.0 cm. et rarement de plus de 2.0 cm.

Case Reports

NON-PENETRATING CHEST INJURY RESULTING IN ISOLATED RUPTURE OF THE VENTRICULAR SEPTUM AND ANGINA PECTORIS*

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RUPTURE OF THE interventricular septum following non-penetrating injury of the chest is rare. Pierce *et al.*,[1] while reviewing the literature from 1847 to 1958, collected 17 cases and added one of their own. Since then three other cases have been described,[2-4] making a total of 21 reported cases.

Modern conditions seem to have increased the incidence of this complication. This lesion is now amenable to surgical correction with great improvement in its prognosis,[1, 4] and emphasis should be placed on early recognition.

An additional case of traumatic rupture of the interventricular septum proved by cardiac catheterization and intracardiac phonocardiography is reported here. The clinical features, early diagnosis and possible treatment of the lesion are stressed.

A hard-rock miner, aged 37, was perfectly well and doing very heavy work before his chest injury. No heart murmurs or other cardiovascular abnormalities were recorded on several previous physical examinations.

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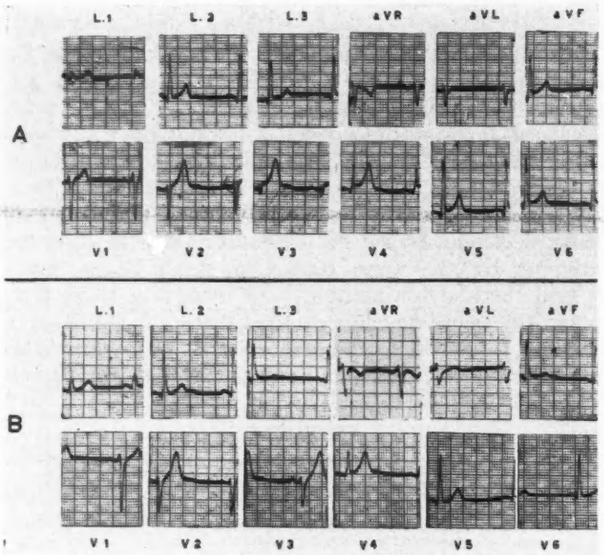

Fig. 1.—(A) ECG one year after injury. S-T elevation in leads V_4, V_5, V_6; R wave decreasing from V_1 to V_3. (B) 22 months after injury. S-T segment is back to normal; slight widening of QRS complex, compared to previous tracing.

On May 3, 1957, he was caught between a three-ton bucket, which struck the front of his chest, and a steam shovel, which struck the back. He collapsed and on regaining consciousness four hours later experienced severe chest pain and coughed up dark red blood. On admission to St. Joseph's Hospital, Blind River, a fracture of the left scapula and contusions of the chest were diagnosed. The patient was treated with oxygen, bed-rest and sedatives and kept supine for two weeks. Most of the soreness subsided and he was discharged on May 16. No cardiac injury was suspected and no electrocardiogram (ECG) was taken.

The patient remained inactive until September 1, when he was sent to a rehabilitation centre. There, during an exercise of lying on his abdomen and attempting to lift his body from the floor, he experienced dyspnœa for the first time and a sharp retrosternal pain of sudden onset; this forced him to stop. The pain and dyspnœa subsided in about one minute, leaving a dull precordial ache which lasted all day. From that time, walking one block quickly or climbing a flight of stairs produced similar pain and dyspnœa.

In October 1957, he was first seen by one of us (W.F.G.) and at that time looked well, although quite obese at 235 lb. Heart rate was regular; blood pressure was 140/80 mm. Hg; a systolic murmur of Grade III (in VI) intensity was heard maximally at the third left interspace, and faintly in the neck. It seems unlikely that this murmur would have been missed even on cursory examination if it had been present in the past. There was no thrill, or sign of heart failure. The only abnormality on fluoroscopy was a slight prominence, without definite enlargement, of the left ventricle. The ECG was considered borderline—slightly suggestive of left ventricular hypertrophy.

During his first hospital stay in the Toronto General Hospital in May 1958, the question of his eligibility for compensation for his cardiac state was raised. On this admission his physical findings were essentially unchanged. The ECG (Fig. 1a) showed S-T segment elevation in leads V_4, V_5 and V_6 and a small R in V_3 and was suggestive of mild myocardial injury. A report of a chest phonocardiogram described the murmur as midsystolic and best recorded in the third left intercostal space. The patient was exercised on the treadmill until he developed chest pain, but no significant electrocardiographic changes resulted. It was decided that he had some degree of cardiac injury which gave rise to the angina pectoris and, from the character of his murmur, that his aorta was damaged. He was discharged on a reducing diet.

On March 30, 1959, having been granted workmen's compensation, the patient was readmitted for further investigation. His weight had come down to 183 lb. and he could now perform more physical activity than before the previous admission. On examination the murmur was somewhat louder than before and was now definitely pansystolic with the same rough quality, and localized to the third and fourth left interspaces; no thrill was felt, nor were signs of heart failure present. Chest phonocardiography confirmed the pansystolic

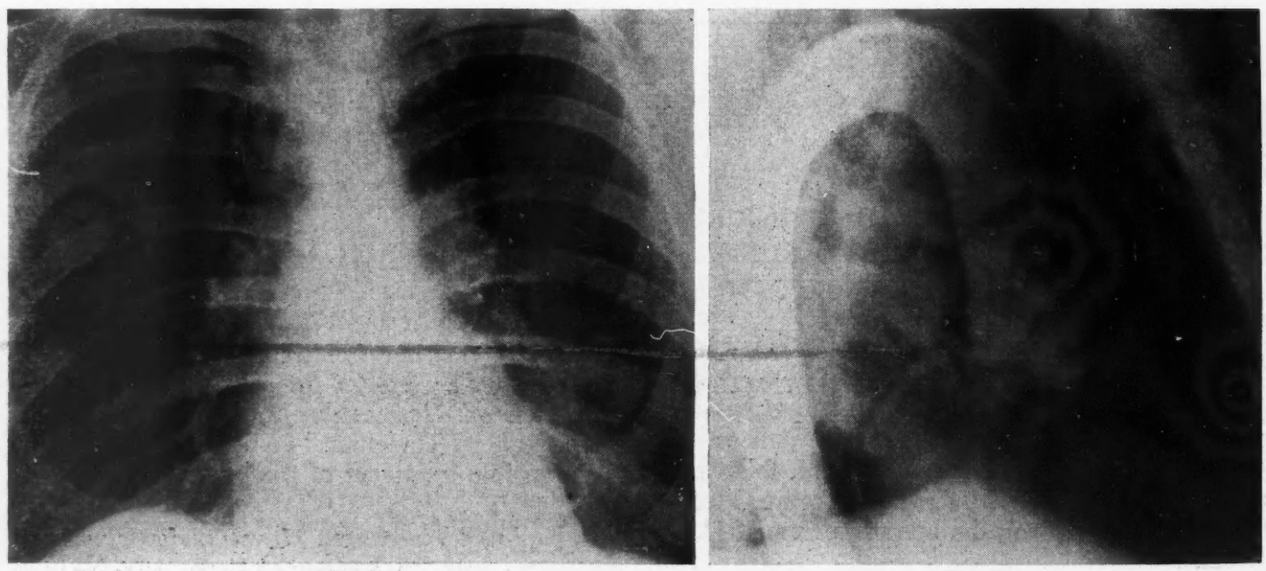

Fig. 2a. Fig. 2b.

Fig. 2a.—Antero-posterior view, 22 months after injury. The heart is normal in size.
Fig. 2b.—Selective aortogram with the tip of the catheter above the aortic valves. Filling of both right and left coronary arteries is shown clearly.

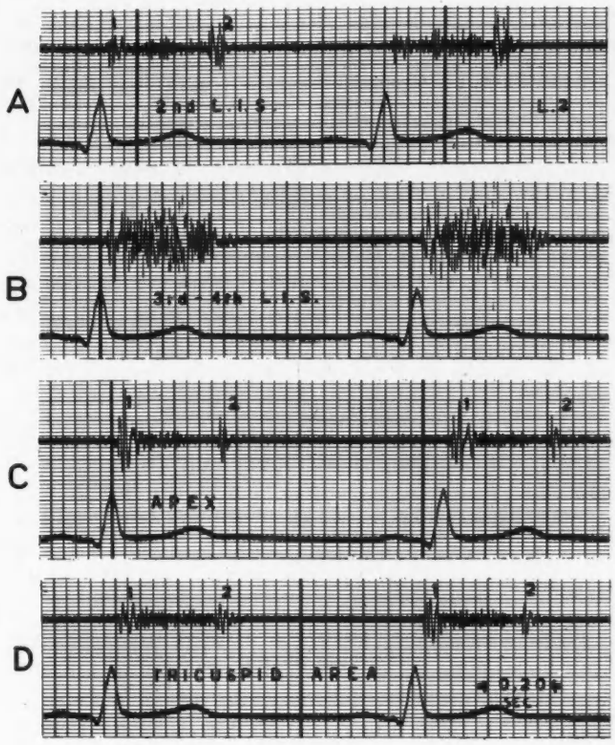

Fig. 3.—Chest phonocardiogram. (A) A soft midsystolic murmur and a split second sound are recorded at the base. (B) A loud pansystolic murmur is present in the 3rd and 4th left intercostal spaces. (C, D) A soft systolic murmur is transmitted to the apical and tricuspid areas.

murmur (Fig. 3). Fluoroscopy and chest radiographs were unchanged (Fig. 2a). The ECG (Fig. 1b), when compared with that of May 10, 1958, showed no abnormal S-T segment elevation in the precordial leads and a QRS complex slightly wider than in the previous tracing. Traumatic ventricular septal defect was considered possible and suspicions were strengthened when a venous dye dilution curve, inscribed on the ear oximeter, suggested a left to right shunt pattern. The results of right heart catheterization are summarized in Table I. During right heart catheterization the catheter went through a ventricular septal defect into the left ventricle where systemic pressures and fully oxygenated blood were obtained. Simultaneous brachial arterial pressure estimation ruled out aortic stenosis. Pulmonary blood flow was calculated to be 120% of the systemic blood flow.

TABLE I.—RIGHT HEART CATHETERIZATION

Location	*Pressure (mm. Hg)*	*O_2 content vol.%*	*O_2 saturation %*
	28		
Pulmonary artery (average of 3 samples)	8	12.40	75.6
Right ventricle:			
high		13.27	81.0
mid		12.39	75.6
low	28		
	0-6 (end diastolic)	11.31	69.0
Right atrium (average of 3 samples)	6 (mean)	11.55	70.5
Sup. vena cava/inf. vena cava (average)		11.78	71.9
Left ventricle	110		
	0-7 (end diastolic)	15.04	91.8

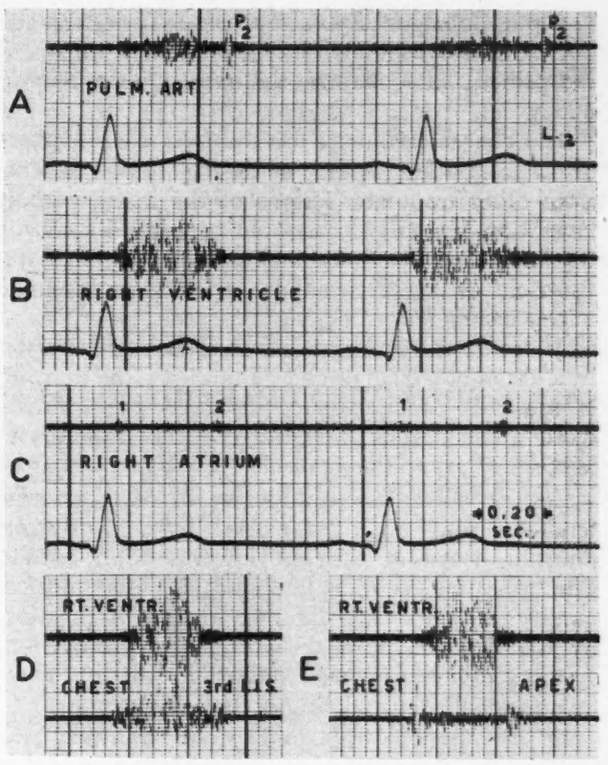

Fig. 4.—Intracardiac phonocardiogram. (A) A flow murmur is recorded within the pulmonary artery with a loud pulmonary closure. (B) A loud pansystolic murmur, diagnostic of ventricular septal defect, is present within the right ventricle. (C) No murmurs are recorded within the right atrium. (D, E) Simultaneous recordings by the phonocatheter from within the right ventricle and externally from the 3rd left intercostal space and the apical region.

An intracardiac phonocardiogram (Fig. 4), recorded by the Lewis technique,[5] revealed a loud pansystolic murmur within the right ventricle, diagnostic of ventricular septal defect.[6, 9, 10]

A coronary angiogram showed good filling and a normal contour for the main coronary arteries and their larger branches (Fig. 2b).

A single Master's two-step test was normal.

COMMENTS

Severe compression of the chest and sudden deceleration are the most frequent causes of septal rupture.[1] This latter may occur immediately as a direct result of trauma or after hours or days, as a result of contusion with delayed necrosis of the septum.[2] Presumably coronary artery injury and septal infarction could also lead to delayed rupture of the interventricular septum. Thus one should listen repeatedly to the heart following a severe chest injury.

Large acquired interventricular communications are often accompanied by congestive heart failure due to sudden overload of the right ventricle. Shock and hæmoptysis are not rare, and perhaps result from associated injuries. These manifestations, together with a harsh systolic murmur and thrill over the midprecordium, should strongly suggest traumatic rupture of the ventricular septum. Occasionally the occurrence of complete A-V block will substantiate the clinical impression

of septal damage.[15] Small ruptures may occur without cardiac symptoms, and a loud murmur, as in the present case, may be the only sign for months and years.[1, 3]

The characteristics of the murmur are important in differentiating rupture of the ventricular septum from other traumatic lesions of the heart, namely laceration of a mitral cusp and rupture of a chorda tendinea or of a papillary muscle of the left ventricle. In the latter three, the injury produces mitral insufficiency. Signs of left atrial enlargement may occur; the murmur is best heard at the apex. In a lesion of a cusp or chorda tendinea the murmur is musical, usually unaccompanied by a thrill,[7] while it is sonorous and bizarre in the patient with rupture of a papillary muscle.[8]

Lesions of the tricuspid valve or of its chordæ tendineæ may be accompanied by a pansystolic murmur heard at the left lower sternal border. The murmur is characterized by its musical quality and increased intensity during inspiration, by the absence of a thrill and the presence of systolic jugular venous pulsation; all of these favouring a tricuspid origin for the murmur.

In our patient the midsystolic murmur was atypical of a ventricular septal defect and, together with the presence of angina of effort, led to the early clinical diagnosis of aortic stenosis. The same erroneous clinical impression was reported by Sissman *et al.*[13] in a case of congenital ventricular septal defect with angina.

Our clinical diagnosis was reviewed when the murmur changed from midsystolic to pansystolic and a venous dye curve was abnormal and compatible with left to right shunt.

A peripheral dye dilution curve may be useful in the clinical diagnosis of septal rupture. To prove the clinical diagnosis, however, and to evaluate the hæmodynamic importance of the interventricular communication, cardiac catheterization is necessary. A significant rise in the oxygen content of the blood samples obtained from the right ventricle and the passage of the catheter across the septal defect into the left ventricle, are the two signs which confirm the diagnosis. Occasionally when the oxygen saturation studies are equivocal and the defect is not crossed, the intracardiac phonocardiogram, by localizing a pansystolic murmur within the right ventricle, will prove the diagnosis.[6, 9, 10]

The association of a traumatic ventricular septal defect with angina pectoris was not described in the literature reviewed. Non-penetrating chest injury may precipitate angina in subjects with underlying coronary artery disease,[2, 11] either by damaging a rigid coronary artery or by producing shock and favouring coronary thrombosis. Angina, as a complication of trauma, is unlikely in subjects with a normal coronary tree.[2] In our case a normal coronary angiogram ruled out pre-existing coronary artery disease and traumatic damage to any major coronary artery. In this case two possibilities are suggested to explain the occurrence of angina: one, myocardial contusion with disruption and thrombosis of the smaller vessels resulting in an impaired oxygen supply to certain areas of the myocardium;[2] two, hæmodynamic consequences of the acquired interventricular communication through which the volume of blood shunting from left to right may increase considerably during exercise, with a consequent reduction of the systemic and coronary blood flow, resulting in angina pectoris. The latter possibility has been suggested by Taussig in a recent report[13] to explain the occurrence of angina in a young patient with congenital ventricular septal defect.

The prognosis for traumatic rupture of the ventricular septum is related chiefly to the size of the defect and the presence of associated lesions.[1, 2] A large defect may rapidly produce death or lead to intractable cardiac failure. In the series of Pierce, Dabbs and Rawson,[1] 10 out of 18 patients died within 15 days. A small defect may allow the patient to carry on for several years without signs of decompensation. Multiple systemic and pulmonary emboli arising from the defect also cause death, although this complication seems to occur more frequently in cases of perforation of the ventricular septum due to myocardial infarction.[14]

The medical treatment of ventricular septal rupture is that of any cardiac injury, namely bedrest, oxygen, sedation and treatment of congestive heart failure should it arise. When the defect is large and cardiac failure progressive, early surgical repair is mandatory and often life-saving.[1] When the defect is large but cardiac symptoms are not present,[3, 4] surgical treatment should be seriously considered, since it has been suggested[1] that the hæmodynamic complications of the acquired ventricular septal defect might evolve more rapidly than those of a congenital lesion of the same size.

When the shunt is small, the patient should be followed up closely because of the known tendency of acquired A-V fistulæ to increase in size.

In our patient, surgical intervention is being considered in the hope that it will improve his angina.

SUMMARY

A case of traumatic rupture of the interventricular septum, associated with angina pectoris secondary to trauma, is described. The only physical sign was a systolic murmur in the third and fourth left intercostal space. The association of murmur with angina led first to the clinical impression of aortic stenosis. The correct diagnosis was established by cardiac catheterization and intracardiac phonocardiography.

The literature is reviewed. Of the 21 cases already reported, this is the only one in which a traumatic ventricular septal defect is associated with angina. Damage to a main coronary artery was excluded in this case by coronary arteriography; other possible causes for the angina are discussed. Treatment and prognosis are reviewed. This complication of trauma is now amenable to surgery.

ADDENDUM

On October 1, 1959, Dr. W. G. Bigelow closed this defect using the heart-lung bypass, and a heat exchanger to lower body temperature. It was described as "something under a centimetre in diameter lying anteriorly and fairly low".

The patient's postoperative course was uneventful, but it is too soon to know whether or not his angina is improved.

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BILATERAL ECTOPIA LENTIS IN MARFAN'S SYNDROME: REVIEW OF FEATURES WITH REPORT OF TWO CASES*

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MARFAN'S syndrome is an uncommon condition. More than 350 cases have been reported since Marfan,[22] in 1896, described a five-year-old girl with spider fingers (pattes d'araignée) and poorly developed musculature. Subsequent reports have indicated that it may be associated with other anomalies. The syndrome is now well recognized in its classical form, but frequently goes unnoticed in its incomplete or atypical form ("forme fruste"). The purpose of this paper is to present the clinical features of Marfan's syndrome in the light of a brief survey of the reported anomalies which may be found and in the reports of two cases with skeletal and ocular manifestations. These patients belonged to two unrelated families. Some of the other members of these families had manifestations of this syndrome.

BRIEF SURVEY OF CLINICAL FEATURES

Although knowledge of the manifestations of Marfan's syndrome is widely disseminated, often only the classical form of the syndrome is diagnosed. Members of the proband's family may present only some of the main features of the "forme fruste". Generally, the patient is underweight, lean, thin, lanky and perpetually tired and often has a melancholic look. Poor development of the musculature and subcutaneous tissue exaggerates the apparent emaciation.

Skeletal Manifestations

Usually the skull is dolichocephalic, with a long narrow face, high forehead, and underdeveloped and underslung lower jaw. The palate is usually narrow and often high-arched,[4] and the external ears are sometimes deformed. The extremities are unusually long, thin and slender. Both clinically and radiologically, the phalanges—particularly the terminal phalanges—and metacarpal and metatarsal bones are long and thin. The feet are long like "fox-feet". Anomalies of the thorax occur in about one in four cases. Pectus excavatum or funnel breast, and scoliosis, kyphosis or lordosis have frequently been recorded. Pectus carinatum or pigeon breast, winging of the scapulæ, hemivertebræ and "fanning" of the ribs have also sometimes been observed.

The joints are often lax and hyperextensible. Subluxation of the knees and dislocation of the hips may occur. Méry and Babonneix[24] drew attention to "high patella" in a further report of Marfan's original case. Booth *et al.*,[5] similarly, recorded increase in length of the patellar ligament. Occasionally the syndrome is combined with arthrogryposis (such a case was observed in the Ottawa General Hospital).[1]

The muscles are usually poorly developed and flaccid. Amyotonia congenita was noted by Young[38] in a patient with arachnodactyly. Dystrophia myotonica has been recently described by Booth *et al.*[5] Pterygium colli (webbing of neck, an anomaly not generally associated with this syndrome) was present in two children with Marfan's syndrome, recently described by Golden and Lakin.[16]

Cardiovascular Anomalies

Piper and Irvin-Jones[32] stressed the frequency of congenital cardiac anomalies. Baer *et al.*[2] associated arachnodactyly with developmental abnormalities of the media of the aorta. Goyette and Palmer[17] reviewed the cardiovascular anomalies in 33 cases of Marfan's syndrome from the literature and one of their own. McKusick[23] summarized such anomalies as follows: (1) Aortic defects: (a) dilatation of aortic ring; (b) dilatation of ascending aorta; (c) dissecting aneurysm; (d) combination of a, b, and c; (e) coarctation; (f) patent ductus arteriosus. (2) Anomalies of pulmonary arteries: (a) dilatation; (b) dissecting aneurysm; (c) microscopic alterations of media. (3) Septal defects: (a) atrial; (b) tetralogy of Fallot. (4) Valvular abnormalities: (a) stretching and sacculation of the aortic cusps; (b) other gross and microscopical

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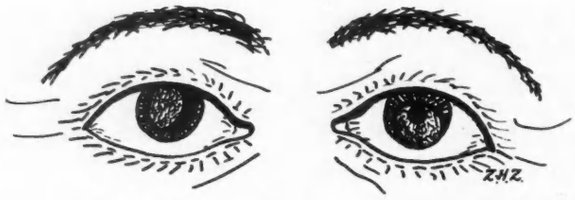

Fig. 1 (Case 1).—Diagrammatic representation of the eyes showing: the right eye, with the dilated pupil, and posterior dislocation of the lens towards the temporal side; and the left eye, with constricted pupil, and the dislocated lens in the anterior chamber.

changes; (c) subacute bacterial endocarditis. (5) Dysrhythmias and conduction defects.

The association of aneurysm of the aorta and aortic insufficiency has been frequently reported in Marfan's syndrome. The aneurysm may produce indentation of the œsophagus demonstrable by fluoroscopy after ingestion of barium. Such a case was reported by Nath and Mittal.[26] Dimond *et al.*[11] published the report of an attempt at surgical repair with a Hufnagel plastic valve in a patient with this syndrome who had developed aortic insufficiency secondary to trauma. Miller and Pearson[25] recently reported mitral insufficiency simulating aortic stenosis, an unusual manifestation in Marfan's syndrome. They found a "jet lesion" consisting of thickened and elevated endocardium on the atrial wall opposite the mitral orifice. In another recent report, Burry[7] described supra-aortic stenosis with this syndrome. Hardin[18] reported rupture of an abdominal aneurysm and fistula formation between the aorta and vena cava: repair with nylon prosthesis was attempted.

Ocular Anomalies

Ocular manifestations of Marfan's syndrome are of interest and often present as problems of visual disability in young children. Most important of these is luxation of the lens. Börger reported in detail a patient who had dislocation of lens and iridodonesis with arachnodactyly. Rados[34] found typical ocular manifestations, including ectopia lentis in 127 and ocular symptoms of questionable significance in 40 among 204 cases of Marfan's syndrome collected from the literature. Other associated anomalies reported are: cataract of lens, coloboma of lens, coloboma of iris, congenital mydriasis or miosis, poor response of pupil to the action of atropine, myopia, megalocornea, strabismus, and nystagmus. Arcus juvenilis was associated in a case of this syndrome described by Golden and Lakin.[16] Black and Landy[3] observed blue scleræ in their cases. Gibson[15] described extreme myopia with loss of convergence in one, and increased epicanthic folds in another case of arachnodactyly. King[21] reported ptosis with ectopia lentis and arachnodactyly. Baer *et al.*[2] observed unexplained exophthalmos. Colour blindness was associated in the cases reported by Neresheimer[27] and Booth *et al.* Ougard and Bédard[29] reported two cases of Marfan's syndrome with bilateral ectopia lentis: they found old detachment of retina in one eye.

Urogenital Anomalies

Urogenital defects have rarely been described in cases of Marfan's syndrome. Genital hypoplasia in males was described by Börger,[4] and undescended testes, by Haridas[19] and Stern.[36] Renal ectopia has been found by Olcott[28] and Fischl and Ruthberg.[13] Booth *et al.*[5] reported one case with polycystic kidneys, and another with congenital ureteric stricture.

Respiratory Anomalies

Anomalies of the lungs are rare and have been described by Börger.[4] Imperfect lobation of the lungs was recorded by Rados.[34]

Mental Defects

The majority of patients appear mentally normal. However, Dax[10] observed mental defect in a number of instances. Gibson[15] described four cases of arachnodactyly in an institutional population, whose associated mental defect varied in grade from moron to idiot.

CASE REPORTS

CASE 1.—D.S., a six-year-old French-Canadian boy, was admitted to the Ottawa General Hospital on August 29, 1957, because of diminution of vision, lacrimation, photophobia and pain in the left eye for one week. The onset had been fairly sudden. He was unable to see properly in bright light but could watch television. He had a normal full-term birth, weighing 7 lb. Developmental history was apparently normal. Intelligence and behaviour were unremarkable. He appeared thin since birth. His long and slender limbs, fingers and toes had always caused difficulty in obtaining shoes of proper size. The right ear was congenitally deformed.

The mother also had a deformed and "shrunken" right ear. One of the patient's sisters had long thin fingers, toes and limbs; hypotonic musculature; high-arched palate, and myopia, but without any other apparent ocular abnormality. There was no heart murmur. The rest of his 10 brothers and sisters were said to be normal; no known history of abnormalities on the father's side or in the preceding generation.

Physical examination revealed a lean and thin boy with a boat-shaped head and an elongated face. The left external ear was normal but the right one appeared prominent and deformed, was flat and flap-like in its upper part, and felt soft as if there was no cartilage. The palate was high-arched.

There was photophobia. Right eye: tremulous iris with dilated pupil; the lens, which appeared small, was found dislocated towards the temporal side (Fig. 1) and floating with a pendulum-like movement in the vitreous. Left eye: the lens was dislocated into the anterior chamber and was "trapped" by a well-constricted pupil (Fig. 1). It appeared like a floating drop of oil, changing its position with the position of the head. Considerable ciliary injection was present. No increase in intraocular pressure was apparent.

Fig. 2 (Case 2).—Photograph showing long and slender limbs with thin and elongated hands, fingers, feet and toes.

The limbs were long, slender and hypotonic; fingers and toes were unusually long and thin. A mild degree of scoliosis was present on the left side. The examination of other systems revealed no abnormality.

The lens was removed from the anterior chamber of the left eye. Eserine had been instilled before operation to keep the pupil constricted and the lens in the anterior chamber. Recovery was uneventful. In July 1959, he was wearing glasses which gave him useful vision in spite of some degree of amblyopia.

CASE 2.—F.H., a six-year-old Irish-Canadian boy, was seen on May 14, 1959, in the outpatient clinic of the Ottawa General Hospital because of poor vision. He had a normal full-term birth and development. His intelligence and behaviour were normal. He had been of thin build since birth. One of his sisters, aged 14, was said to have long and thin limbs, fingers, feet and toes. His brothers and other sisters, seven in all, seemed normal.

Physical examination showed a slender boy with long and slender limbs, hands, fingers, feet and toes (Fig. 2). All limbs were hypotonic. Each patellar ligament measured approximately an inch (2.5 cm.) in length. The face was elongated and the palate was high-arched. There was no photophobia. When the pupils were dilated, the lens on each side was found to be dislocated posteriorly, upwards and to the temporal side (Fig. 3). Intraocular tension was apparently not increased.

COMMENTS

In both of these cases the presenting symptoms were related to the dislocation of the lens. In Case 1, the anterior dislocation of the lens in the left eye was presumably spontaneous and gave rise to considerable ciliary reaction and constriction of the pupil which responded poorly to atropine. In cases of Marfan's syndrome, it is difficult to detect any luxation of the lens in the presence of poor pupillary dilatation, sometimes even after instillation of atropine. Often there is amblyopia even with a lens of normal transparency and it is apparently caused by optical changes due to the fact that the equator of the lens occupies the optical centre of the eye. There is also superadded astigmatism of the lens.

Fig. 3 (Case 2).—Diagrammatic representation of the eyes showing the dilated pupils and bilateral, posterior dislocation of the lenses towards the temporo-superior side.

Extraction of the lens is indicated in adults when cataract or loss of visual acuity interferes with occupation. In children, the problem is more difficult. Glasses should be prescribed, taking advantage of the aphakic portion of the eye and extraction of the lens delayed until the vision becomes inadequate. Choyce[8] reported a case of Marfan's syndrome, with spontaneous dislocation of the lens in the anterior chamber of the eye, where an attempt to replace the lens in the posterior chamber by the technique described by Das Gupta and Basu[9] led to the onset of acute congestive glaucoma. In cases of anterior dislocation, he suggests removing the lens without delay. In the first case presented here removal of the lens from the anterior chamber greatly relieved the considerable ciliary reaction.

The etiology of Marfan's syndrome is obscure. The disorders have been explained on the basis of congenital mesodermal dystrophy, determined early in embryonic life. Marfan's syndrome is also ascribed to hormonal disturbance. Stern[36] suggests a genotype change affecting both the mesoderm and endocrines. McKusick[23] presumed it to be an abiotrophy involving the elastic tissue which wears out prematurely under the usual stress and strain. It has been found that about 40% of those with arachnodactyly, like the cases presented here, also had bilateral congenital ectopia lentis. Pino *et al.*[31] explain it as a dystrophic change in the tunica vascularis lentis, a mesodermal derivative which invests the embryonic lens, or as due to a defective suspensory ligament.

A reasonable interpretation would be that two dominant genes are linked in this syndrome, one affecting the lens and the other the skeleton. Ectopia lentis, which is a strict dominant by itself, is frequently missing in histories of arachnodactyly, but this absence might be explained by an intergenic effect in which the ectopia is suppressed. If this explanation is correct, as Gates[14] suggested, one would expect to find families with arachnodactyly but without ectopia lentis.

Scoliosis, dissecting aneurysms of the aorta, and other cardiovascular lesions, similar to those seen in Marfan's syndrome, have been experimentally produced in rats fed *Lathyrus ororatus* (sweet pea) seeds, as reported by Ponseti and Baird,[33] and Walker and Wirtschafter.[37] McKusick[23] pointed out that although the basic defects were not identical in the natural and the experimental syndromes, such studies may provide a lead to the inborn errors of metabolism which might have formed the basis of the abnormality of the aorta in Marfan's syndrome.

Passow[30] endeavoured to link up this syndrome with that of status dysraphicus, a mild form of syringomyelia, or faulty closure of neural tube. He noted its frequent association with Horner's syndrome and heterochromidia iridis, which are both dependent on disturbance of the cervical sympathetic. Bremer[6] had found long span, funnel chest, kyphoscoliosis, winged scapulæ and unequal mammæ associated with syringomyelia in families.

Ellis[12] pointed out that in several other syndromes, skeletal and ocular abnormalities are both present, namely, gargoylism or chondro-osteo-dystrophy and corneal opacity, apical dystrophy and coloboma,[35] punctate epiphyseal dysplasia and cataract, and polydactyly with retinal dystrophy. Gates suggested the addition of brittle bones and blue scleræ. The similarity of some of these features of Marfan's syndrome with those of Ehlers-Danlos syndrome is interesting, and includes also hyperextensibility of the joints. Sometimes congenital lenticular anomalies are present in the Ehlers-Danlos syndrome (recently pointed out in a previous paper[39]), for example, lenticular opacities, observed by Johnson and Falls.[20]

SUMMARY

A brief survey of the abnormalities which may be found in patients with Marfan's syndrome is given. The two patients described, from two different families, had bilateral ectopia lentis. The lens of the left eye of the first patient was dislocated into the anterior chamber.

I am indebted to Dr. J. D. Allen, associate professor of ophthalmology, for his help and permission to include his cases, to Dr. D. J. Conway, professor of pædiatrics, University of Ottawa, for his suggestions, and to Miss M. Gauthier, for her secretarial assistance.

ADDENDUM

Since this paper was submitted for publication, a case of Marfan's syndrome has been reported (Tuna, N.: *Dis. Chest*, 36: 204, 1959), in which the patient had a large aneurysmal venous dilatation in the right supraclavicular fossa about the size of a tennis ball, which used to enlarge at the height of congestive cardiac failure and disappear completely after improvement. Apparently, this type of venous anomaly has not been reported with this syndrome. The patient also had severe testicular atrophy and sexual impotence.

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SHORT COMMUNICATION

THE USE OF A RECTAL SUPPOSITORY OF BISACODYL (DULCOLAX) IN GERIATRIC PATIENTS*

J. G. PINCOCK, M.D., F.A.C.P., *St. James, Man.*

IN A LARGE geriatric unit the maintenance of proper bowel control becomes an important aspect of patient care. Inadequate evacuation can frequently result in serious consequences, notably diarrhœa, impaction, obstruction and, as well, urological problems secondary to the pressure of a loaded colon upon the bladder and sometimes upon the ureters. In order to prevent these problems, a careful review of bowel function is necessary in any unit which has a considerable number of bedridden patients. The use of repetitive enemas has been a standard method of ensuring adequate evacuation. These, however, are time-consuming

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†Bisacodyl is marketed under the trade-name of Dulcolax by Geigy Pharmaceuticals.

for the staff and, at times, annoying to the patients, and require considerably more manipulation and organization than would be necessary if some simpler method could be discovered.

Various means have been attempted by the use of laxatives, which act either through increasing bulk or through mucosal irritation, to provide a method of overcoming the need for repetitive enemas. Various types of suppositories have also been used with indifferent results. Some of the criteria are that there be no irritation on repetitive use; that their action be reasonably prompt; that they produce no bowel spasm, and that evacuation be complete.

In 1953, the use of a suppository with an active ingredient of the pyridylmethane group was developed which fulfilled many of these criteria. This substance, bisacodyl (Dulcolax*), is colourless, insoluble in water and alkaline solutions but soluble in mineral acids and organic solids. Pharmacologically, it appears that through direct action on the mucosa of the colon, it produces a normal bowel action. Little effect has been found upon small bowel function; no irritative effect was produced though used frequently; it has the capacity to produce satisfactory emptying of the large bowel. Although the exact mode of action is as yet undetermined, it has been used fairly extensively in clinical practice and it seemed to be reasonably reliable. Accordingly it was felt that a therapeutic trial should be given of this substance to determine its effectiveness in older people and, in particular, in those who were chronically bedridden.

METHOD

A double-blind study on 100 trials was carried out on a group of chronically bedridden patients at Deer Lodge Hospital. The diagnoses were widely variant, including severe cardiac, neurological and orthopædic disabilities. The average age of these patients was 73 and they had, over a period of some time, required assistance in evacuation on a more or less regular basis, in the form of enemas. Two suppositories were used labelled "C" and "D", which differed only in the one active ingredient.*

On successive days patients were given a suppository and if at the end of 2½ hours an adequate emptying of the bowel had not occurred, an enema was given. The nursing staff simply kept a record of which suppository (C or D) was given, and these were intermingled so that no one patient had either one or the other. Results were classified as good if a satisfactory normal stool was produced within the required period and adequate emptying of the colon had occurred, as defined by rectal examination. They were classified as poor if an enema was required, or if an adequate movement had not occurred within 2½ hours, or if residual fæces was present subsequent to evacuation.

*Dulcolax and a glycerin placebo were supplied through the courtesy of Geigy Pharmaceuticals.

TABLE I.—RESULTS OF DOUBLE-BLIND STUDY

	C		*D*	
	No.	*Per cent*	*No.*	*Per cent*
Good	14	28%	37	78%
Poor	34	72%	10	22%

Suppository labelled "C" is a placebo and that labelled "D" contains the active ingredient—10 mg. of bisacodyl (Dulcolax).

RESULTS

As can be seen from Table I, the suppositories containing the active ingredient produced an excellent effect. There was a considerable difference between the two results and less than 25% of the patients receiving the active substance required any other type of bowel assistance. To evaluate the situation further, the patients' reactions were requested in order to determine, if possible, whether reasonable comfort had resulted. None of the patients with the active ingredient complained of irritation or difficulty at any time, whereas with the placebo a considerable number felt that the results were inadequate and were accordingly displeased and unhappy. No incidents of bowel difficulty occurred during this period nor was there any evidence of irritation in eight patients who had sigmoidoscopic examinations during the time they were receiving the active substance.

In order to amplify further the effects of this drug, 12 patients were given bisacodyl suppositories every other day for a period of three weeks, in an attempt to discover if the persistent use of the substance produced habituation or an inadequate effect. The results in all 12 have been quite satisfactory, and at the end of three weeks the incidence of adequate evacuation was as high as on the initial study. No patient in this group developed any bowel complaint nor was there any evidence of toxicity.

CONCLUSIONS

The results of this study indicate that the substance bis(p-acetoxyphenyl)-2-pyridylmethane or bisacodyl (Dulcolax) is effective in producing normal bowel action in bedridden patients of a geriatric service. With this method, considerable patient comfort can be obtained, and a considerable amount of staff time can be saved and spent in more creative efforts to maintain the patients' interests and comfort. Although no specific mode of action has as yet been clearly demonstrated, the drug appears safe and effective over reasonable periods of time on clinical trial; problems of habituation and toxicity are minimal.

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A LEGACY OF MEDICAL HISTORY

Two books have recently reminded us that a study of history is by no means the profitless pursuit most schoolchildren find it, but a very practical help in understanding and appraising present-day situations. Both books deal with our sister body, the British Medical Association; while one, *The Life and Times of Sir Charles Hastings* by McMenemey,[1] gives an account only of the formative years of the Association, the other, *Doctors' Commons* by Vaughan,[2] carries the story right through to the present day. Both are worth reading, though Dr. McMenemey's very detailed study is much tougher going than the broader outline sketched in with bold strokes by Mr. Vaughan.

Several points of interest raised by a study of these books may be worth emphasis, because they are so often overlooked.

One striking feature of both books is the revelation of the extraordinary degree of public spirit and social conscience manifested by our forerunners in the British Medical Association. To many of our lay critics, a national medical association is synonymous with a trade union. It exists, they say, to feather the nests of the doctors and has always put the interests of its members before those of the community. This is a calumny which is unfortunately sometimes repeated by less informed members of the profession, who would be well advised to collect a few historical data from these two books—and from MacDermot's *History of the Canadian Medical Association*—before passing a hasty judgment on the activities of organized medicine.

For instance, how many people realize that it was the British Medical Association, and not the government, which pioneered the movement in Britain for an extension of the prepayment of medical care in the thirties? Soon after the guns had ceased firing at Dunkirk in 1940, the British Medical Association's senior statesmen were once more considering plans for a health service for the nation and preparing a document which Lord Beveridge a little later drew upon extensively in his famous Report. The later struggle with government over the National Health Service was not based on opposition to the principle of prepaid medical care—a principle also endorsed by the Canadian Medical Association—but on objection to certain points thought to interfere with the provision of a service satisfactory to both doctor and patient alike. As someone said at a 1945 meeting, "No-one would suppose . . . that the B.M.A. is the body that has been hammering at the Government's door for medical reforms."

And this was not by any means the only time that organized medicine hammered at the government's door in the interests of society. Many people no doubt imagine that Miss Florence Nightingale almost singlehandedly abolished the medical muddle in the British Army so appallingly exposed in the Crimea. Vaughan reminds us that, whatever Miss Nightingale's role in this, the credit for the establishment of a satisfactory army medical corps must go to the British Medical Association, who between 1855 and 1898 hammered away at government with tenacity and patience. The campaign began in February 1855 when Cormack, editor of the *British Medical Journal*, opened fire on the Army Medical Department in the first of a series of withering leading articles, and ended 33 years later after "one of the most formidable and authoritative deputations the B.M.A. had ever assembled", including nearly all of the Association's principal officers, at last gained a total victory over governmental muddle and procrastination.

The list of such victories is long—better medical care of paupers, reform of medical education, abolition of branding as an Army punishment, suppression of baby farming, control of worthless quack remedies including dangerous abortifacients and such nostrums as chalk and soft paraffin for leg ulcers.

Yes, national medical associations have a unique value when they have the courage to attack or resist social evils even at the risk of inevitable unpopularity; when they have the tenacity of purpose to continue their efforts for as many years as are necessary to gain their point; and when they can honestly examine their collective conscience and say that their actions are dictated by the obligations imposed on them by the profession of medicine.

To do this is of course inevitably to risk unpopularity. The British Medical Association was not exactly popular with the newspapers when it attacked the secret remedies which brought them in millions of dollars worth of advertising, and the old claptrap about doctors wanting to eliminate competition was freely used against them, as it had been when they wanted to reform medical education, and as it will be in the future whenever they

step on someone's financial toes. But it would seem that someone has to do these unpopular things, and the example of our medical forefathers should give us heart for any struggles to come.

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Editorial Comments

HOME AND SANATORIUM TREATMENT OF TUBERCULOSIS

A recent issue of the *Bulletin of the World Health Organization* (21: 51, 1959) outlines in detail the controlled study conducted in India with a view to comparing results of home and sanatorium treatment of tuberculosis. The study was set up in 1956 by the India Council of Medical Research, the Madras Government, WHO and the Medical Research Council of Great Britain.

The number of cases of active tuberculosis in India has been estimated at 2½ million, but there are only 23,000 beds available for treatment. The obvious advantages of sanatorium care are accepted even in India but, because facilities are hopelessly inadequate to deal with the number of cases, a home care program with chemotherapy would be expected to produce considerably better results than no treatment at all.

In a section of the city of Madras, 163 newly diagnosed tuberculous patients of all ages fulfilling certain criteria were admitted to the study and treated at home or in a sanatorium on a random basis. Each group was treated for 12 months with isoniazid and PAS. The sanatorium group had rest, nursing, good accommodation, supervised drug administration and a good diet. By contrast, home treatment meant little or no rest or restriction of activity, little nursing, poor accommodation, unsupervised and irregular drug administration, an inferior diet, and only the very occasional visit from a doctor or public health nurse.

At the end of 12 months the sanatorium group had gained more weight and had lower erythrocyte sedimentation rates than the home group, although both these factors appeared to be unrelated to the progress of the disease. In the first six months there was no significant difference in the radiographic improvement in either group, but in the second six months, and therefore over the whole 12-month period, the sanatorium patients made slightly better progress. At the end of 12 months, 10% of patients in each series still had positive sputum, *9% of those at home* and *4% of those in hospital* yielding resistant cultures. There was no difference in drug toxicity or allergy in the two groups.

Many more sociological difficulties arose in the family life of the sanatorium group than the home group, the most serious of these, such as husband or wife desertion, being directly due to the spouse's being in hospital.

Although the opinion is voiced in some quarters that sanatorium treatment is no longer necessary and patients do equally well at home, there have been comparatively few controlled studies of these opposing methods of treatment. This study is of great interest, therefore, because in the two groups, one treated under far from ideal conditions at home, and the other under strict sanatorium routine, home treatment gave results very closely approaching those in sanatorium, even though the majority had extensive disease.

It is of great interest that poor diet, unsatisfactory accommodation, inadequate rest, probably irregular drug taking, and lack of regular medical and nursing supervision made so little difference to the good progress of the home-treated group. The results so far reported relate to one year of treatment only. Relapse rates and contact infection rates are perhaps the most important factors for further study in each group and will need to be reported on before acceptance can be given to home treatment as the method of choice.

In India and other countries where there is a serious inadequacy of hospital treatment facilities, it is obviously a great advance to be able to treat large numbers of patients at home, even in a poor environment and even though 10% of such patients may develop resistant organisms.

In Canada with its adequate sanatorium facilities and well-established treatment routines, the record in tuberculosis treatment is now almost the best in the world. Sanatorium treatment, for an initial period at least, would appear to be of benefit to all patients and their families, for it must not be forgotten that tuberculosis is still an infectious disease, and the incidence is five times as great in contacts as in the general population. The initial education of the patient, the establishment of a satisfactory drug routine, the management of drug toxicity and allergy, and the assurance that the patient is actually taking his drugs are all obvious advantages of sanatorium stay.

The danger of the development of drug-resistant organisms is probably the greatest problem in tuberculosis control today. For the International Union Against Tuberculosis, four sanatoria in Canada were asked to report on the sensitivity of tubercle bacilli to the standard drugs on at least 100 consecutive patient admissions in 1957. Some of these were newly diagnosed cases, and others were re-admissions. Some had had chemotherapy and some had had none.

Of the 218 sputum-positive patients studied 28% were resistant to streptomycin, 6% to PAS, 14% to isoniazid, and 4% to all three drugs.

With our well-tried and satisfactory sanatorium system producing such good results in this country, it would seem wise to continue this as part of the treatment for almost every patient, at least until he is non-infectious and his disease is obviously coming under control. At this point, hospital stay in most cases can be shortened. This

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is what is already happening in most sanatoria in Canada. As these patients are leaving sanatoria much earlier to continue drug treatment at home, the medical officer of health and the family doctor will need to be brought more into the picture and there will need to be considerable development of the chest clinic and public health nursing services. C.W.L.J.

LA SCHIZOPHRÉNIE JUVÉNILE

La médecine a tendance à se détourner de la thérapie pour s'orienter de plus en plus vers la prévention. Lorsque la prévention d'une affection ne peut être atteinte intégralement, le diagnostic précoce en est la forme qui s'y rapproche le plus. Cette orientation se manifeste aussi dans le domaine de l'hygiène mentale et de la psychiatrie. On déplore souvent le grand nombre de lits occupés dans les hôpitaux psychiatriques par les schizophrènes. Ne prétend-on pas que chaque enfant d'Europe ou d'Amérique apporte en naissant un risque, de l'ordre de 1% de sombrer un jour ou l'autre dans la schizophrénie s'il atteint l'âge de 55 ans?[1] Ces déments précoces, selon l'ancienne terminologie, ont une espérance de vie qui leur permet d'atteindre un âge assez avancé et même si certains progrès ont été réalisés dans la thérapie il n'en reste pas moins vrai qu'une proportion importante d'entre eux constitue une population permanente des hôpitaux pour malades mentaux.

L'amplitude du problème se mesure à la découverte, vers 1940, de la schizophrénie infantile. La forme *præcocissima* a, depuis, fait l'objet d'un intérêt grandissant. Koegler et Colbert de Los Angeles y ont récemment consacré un article[2] destiné surtout à l'usage des praticiens qu'ils mettent en garde contre les embûches que présente le diagnostic de ce syndrome à ses débuts. La schizophrénie juvénile a avantage à être reconnue d'emblée puisque moins longue est la durée des symptômes, meilleur en serait l'espoir de guérison. Le travail de ces auteurs repose sur l'observation de 34 enfants chez qui la schizophrénie s'est manifestée avant l'âge de cinq ans.

D'après leur expérience, le diagnostic doit être fondé sur les données recueillies dans huit champs d'observation: à savoir, l'apparence du petit malade. son langage, sa motilité et sa posture, ses formules de jeu, ses contacts inter-personnels, le contenu de sa pensée, son aptitude à apprendre et ses antécédents personnels.

Un sondage effectué dans les familles de ces malades au moyen d'un questionnaire a mis à jour certains aspects du comportement de ces enfants qui peuvent contribuer à situer le diagnostic. Ainsi, l'enfant schizophrène par rapport à l'enfant normal, manifesterait moins d'intérêt aux choses de son milieu en général sauf peut-être à la musique, il s'adapterait mal à la naissance d'une sœur ou d'un frère cadet et montrerait peu de tendance à partager quoi que ce soit avec ses compagnons. La maison est bouleversée par sa présence. Une fois engagé dans une sphère d'activité il est difficile de l'en tirer comme si, par vitesse acquise, il ne pouvait plus s'arrêter—ce trait contraste fortement avec le distraction facile de l'enfant normal. Il a tendance à marcher sur la pointe des pieds et à virevolter sur lui-même comme une toupie, paraît prendre plaisir à monter sur les tables, les chaises et autres meubles et à en sauter. Les traumatismes qu'il peut s'infliger ne semblent éveiller chez lui que très peu de douleur. Le rythme de ses périodes de sommeil et de veille est irrégulier.

L'irrégularité est une des caractéristiques qui a frappé Fish dans l'étude[3] qu'elle a faite de nourrissons devenus schizophrènes. Elle a remarqué dans le domaine de l'activité motrice, du développement du langage et de la fonction sociale que le taux de croissance est inconstant, irrégulier et fait d'une combinaison d'arriération et de précocité. Le développement est marqué par des poussées en flèche suivies non seulement d'arrêts ou de paliers, mais aussi de retours en arrière.[4] Non seulement ce manque d'intégration peut-il se manifester entre différentes fonctions mais on peut aussi le retrouver dans une même fonction et à des degrés variables. L'auteur fait remarquer que ces désordres biologiques dans un cas qu'elle a été à même de suivre dès le tout jeune âge, ont précédé les manifestations d'angoisse et les symptômes psychologiques.

Les désordres caractériels que l'on peut observer au début de l'enfance sont quelquefois le résultat de lésions organiques comme par exemple dans la maladie de Heller caractérisée par une dégénérescence lipoïdique diffuse des cellules ganglionnaires. Cette affection qui se rapproche beaucoup de la maladie de Tay-Sachs ou idiotie amaurotique infantile mais sans cécité, ne devrait pas être nommée par cet éponyme puisque Heller semble avoir inclus dans ses descriptions plusieurs entités différentes (dont, probablement, certains cas de schizophrénie juvénile) ne possédant en commun que certaines apparences.[5]

Le décalage dans la maturation des différentes fonctions peut expliquer l'itération dans la formule de jeu de l'enfant schizophrène en vue de la difficulté d'adaptation d'une forme d'activité à une autre. Ces enfants s'agrippent aux fonctions qu'ils connaissent à cause d'un retard dans le développement d'autres fonctions physiologiques. Ainsi a-t-on découvert que plusieurs enfants schizophrènes réagissent peu ou pas du tout à la stimulation calorifique vestibulaire. Comme on sait qu'ils éprouvent aussi quelques difficultés à percevoir la position de leur corps dans l'espace, les sauts et les virevoltes décrits plus haut ne pourraient représenter que l'activité à leur portée.[2]

Les lésions organiques si elles sont présentes chez ces enfants sont subtiles et diffuses et sans signes bien déterminés de destructions locales du cerveau. On a songé ici à incriminer quelque aberration de la substance réticulaire mais ces enfants ont-ils bénéficié des recherches d'Osmond et Hoffer?[6] Il serait intéressant de rechercher chez eux la présence de taraxéine.

Parmi les facteurs non-génétiques de nature psychologique, les traumatismes psychologiques surtout s'ils sont infligés depuis l'enfance et pendant longtemps, posséderaient une importance étiologique.[1] A ce sujet le groupe d'étude sur la schizophrénie de l'Organisation Mondiale de la

Santé affirmait il y a quelques années qu'il semble exister un rapport statistique entre le nombre de schizophrènes et le degré de désorganisation sociale dans une collectivité, tel que manifesté par l'augmentation de l'isolement social, le grand nombre de personnes non mariées et le degré de pauvreté. La signification exacte de ce rapport n'a pas été établie. D'autres données laissent entendre que l'on voit un accroissement de la schizophrénie chez les populations en proie à de rapides changements culturels qui entraînent la dissolution des normes sociales et culturelles. Ces données sont plus probantes en ce qui se rapporte à certains états paranoïaques apparentés à la schizophrénie, qu'à la schizophrénie même. Chez l'enfant la régression peut être amorcée par un incident relativement banal comme un séjour de la mère à l'hôpital ou la naissance d'un cadet, incident qui n'aurait que des répercussions minimes et transitoires chez un enfant normal. Malgré l'importance que peut revêtir un traumatisme psychologique, l'aspect constitutionnel de ces troubles doit être opposé à la conception superficielle, mal fondée mais malheureusement assez répandue, que tous les problèmes émotifs de l'enfance sont créés par l'attitude fautive des parents. La culpabilité qui pourrait être soulevée chez ceux-ci est non seulement inutile mais elle risque même de nuire à la thérapie de ces enfants.

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How to Define and Diagnose Chronic Bronchitis

Those investigating chronic bronchitis are usually faced with the difficulty of defining the condition and of drawing the line between the earliest phase of this disease and health. Fletcher, Elmes, Fairbairn and Wood investigated this problem by asking a number of men and women in London (England) to complete a questionnaire regarding cough, expectoration and other symptoms on two separate occasions. Their answers were then tested by comparing them with measurements of the sputum volume, ventilatory capacity, and absenteeism from work. In a recent paper they report the methods which they used and the results of this investigation (*Brit. M. J.*, 2: 257, 1959).

A group of 192 postmen, aged 40 to 59, and 192 women of the same age range, engaged in sorting documents in the post office, were interviewed on one occasion and 144 of each group were interviewed twice. Sputum brought up in the first hour after rising was collected and measured on several occasions in the spring and winter. The maximum breathing capacity (M.B.C.) was estimated for each person and the sickness absence records of each subject were inspected for the previous three years and recorded for comparison with chest illnesses during this period. The subjects denying that they produced phlegm altogether and those who have it on rising only were found to have a significantly higher M.B.C. (110 to 120 litres/minute) than those who produced phlegm all the year or even in the winter only (95 to 105 litres/minute). Although sputum collection is a more objective method, it is more troublesome and may be distasteful and is also liable to error in collection. Asking questions regarding phlegm production is easy and, provided it is done carefully and on various occasions, may be just as accurate. Questions about dyspnœa in these subjects seem to correlate only poorly with the measurements of M.B.C. Comparisons of answers regarding past illnesses and actual records kept by the post office showed that there was no marked tendency to exaggerate or forget past illnesses. Although the numbers of men who had never smoked was small, their mean M.B.C. was found to be significantly higher than that of the smokers.

In contrast to the other workers in this field who have preferred to diagnose chronic bronchitis only in people with persistent cough and sputum with dyspnœa, Fletcher *et al.* believe that it is important to admit all those who have persistent cough and sputum to the diagnosis of bronchitis. This would include all those who are still in the earliest phase of bronchitis. They would, however, exclude from the diagnosis of chronic bronchitis subjects who do not produce sputum although they believe that this would have to be confirmed in larger numbers of subjects. Within the framework of their questionary, they define chronic bronchitis as "the production of phlegm on most days for at least three months in each year." Grade I included those who produce phlegm only on rising or only later in the day and this corresponds to the measurement of less than 2 ml. of sputum in the first hour after rising in the winter. Grade II comprises those who produce phlegm both on rising and throughout the day and with a sputum quantity of more than 2 ml. a day. Disability from impairment of ventilatory capacity, and recurrent chest illnesses, are complications and it is important to recognize the disease before it has resulted in disability.

Whilst the findings from this study are in themselves highly interesting, showing as they do certain significant differences between the symptomatology of bronchitis in men and in women, the value of this paper lies in the fact that it offers us a guide for similar studies to be undertaken in any other country or place. It should not be too difficult to adjust the questionary which is attached to this paper to any situation. Although the frequency of chronic bronchitis is not as high in Canada as in the United Kingdom, its true incidence is not known and it is quite possible that some of the chronic pulmonary cripples that are being encountered in ever greater numbers in recent years may have suffered from formerly unrecognized chronic bronchitis or a bronchitis that was ignored. Studies such as that of Fletcher *et al.* are urgently needed in this country. W. GROBIN

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Medical News in brief

ANTERIOR TIBIAL SYNDROME DUE TO ARTERIAL EMBOLISM AND THROMBOSIS

Sudden severe pain in the muscles of the anterior tibial compartment followed by swelling, hardness and acute tenderness to pressure with stretching, paralysis and finally foot-drop, comprise the anterior tibial syndrome. The muscles undergo ischæmic necrosis, pulsation in the dorsalis pedis artery ceases for a few days or longer, and involvement of the anterior tibial nerve causes paralysis of the extensor digitorum brevis and anæsthesia over the first interdigital cleft. Three factors are distinguished: (1) unaccustomed exertion involving the anterior muscle group; (2) local exogenous mechanical factors causing a rise in intracompartmental pressure, and (3) embolic or thrombotic occlusion of the anterior tibial artery or parent trunk.

Freedman and Knowles (*Brit. M. J.*, 2: 270, 1959) describe five cases, two of them due to embolism and three to thrombosis. Of the latter cases, one followed hæmorrhagic shock and two were associated with senile atherosclerosis. In cases due to post-exertional swelling of the muscles, decompression of the compartment with a long incision dividing the deep fascia is recommended. This should be done promptly in order to re-establish the blood supply to the muscles. In cases due to arterial thrombosis or embolism, such as those presented, simultaneous administration of papaverine, nylidrine hydrochloride and anticoagulants offers hope of resolution although these measures failed in the cases described.

PREVENTION OF SURGICAL HEART BLOCK BY THE USE OF SUPRAVITAL STAIN

A method is described of preventing surgical heart block by visualizing the bundle of His by means of supravital staining. Placement of closing sutures in ventricular septal or ostium primum defects can then be safely effected. This staining technique was used on three patients by Allen, Lederman and Pearl (*J. Thor. & Card. Surg.*, 38: 57, 1959). The first was a nine-year-old boy with a common ventricle that was repaired by making an ivalon septum. The exact site of suture placement was difficult to determine since no remnant of septal tissue was present. After potassium arrest was instituted, 5% elemental iodine in a 10% sodium iodide solution was painted on the endocardium of the common ventricle and showed up a lacy conduction network on the superoanterior and superoposterior aspects. In this way, sutures were placed in the wall where conduction tissue was absent, and upon completion of the repair the potassium arrest was terminated with rapid restoration of sinus rhythm.

The second patient was a three-year-old boy with advanced pulmonary hypertension and a large ventricular septal defect. After potassium arrest, the defect could be seen to involve the entire septum from the crista supraventricularis distally to the pulmonary and aortic valves, which were separated by a millimetre of fibrous tissue. Five per cent iodine solution outlined the common bundle (or the right bundle branch) in the postero-inferior margin of the septal defect and, as a consequence, sutures were placed wide of this tissue in effecting a repair. After completion, sinus rhythm was restored.

The third case involved an eight-year-old girl with a membranous ventricular septal defect and a pulmonary artery pressure of 90/40 mm. Hg. After potassium arrest had been induced, 5% iodine solution was painted along the margins of the defect but failed to reveal conduction tissue. After repair of the defect, the patient developed permanent third-degree heart block. The conduction bundle failed to stain, probably because it was deep within the ventricular septum and beyond the penetration of the iodine solution.

This is a preliminary report based on experimental work and limited patient application. However, the writers believe that further experience may prove that supravital staining of the conduction system in the right ventricle will add to the safety of potassium arrest and may reduce the incidence of complete heart block in the electrically inactive myocardium.

TRIVALENT ORAL POLIO VACCINE

A liquid trivalent oral polio vaccine was fed to approximately 550 persons, principally employees of a pharmaceutical laboratory in New York, and the immunological response was studied. The viruses present in the vaccine were Lederle strains SM (type I), MEF_1 (type II), and FOX (type III) isolate. These are strains which have been used previously in studies in other countries. Much better neutralizing antibody response was obtained in individuals fed a 2-ml. dose of the trivalent vaccine than in those given a 1-ml. dose. The most favourable results were obtained in a group of 188 persons fed the largest dose, namely, $10^{6.1}$ (one million, two hundred thousand) TCD_{50} of each of the three types of polio virus in 2 ml. of vaccine. The conversion rate from negative to positive with this dose was 93%. Two persons were left without antibodies to type I, 9 to type II, and none to type III. Results indicate that it is both feasible and practicable to immunize against all three types of polio virus by a single feeding of a trivalent oral polio virus vaccine.

AGE, SEX AND TRUTHFULNESS

Another piece of mythology about the female sex has failed to stand up to statistical inquiry. This is the age-old belief that women habitually lie about their age whereas men do not. Masor of New York (*J. Am. Geriatrics Soc.*, 7: 859, 1959) has been keeping statistics over a period of eight years on a group of patients in three categories: young (18-25 years), middle-aged (30-50 years) and elderly (over 50 years). None of the persons in the young group ever lied about their age, but no less than 7 out of 52 males in the middle-aged group told lies, as against 5 out of 48 women. Once the 50-year mark was passed, only one male lied about his age, and no women did so. Whether the patients were single or married apparently had no bearing on their truthfulness. However, Masor concludes that "'though the females lied less frequently than the males, they were the bigger liars".

(Continued on advertising page 14)

NEW DRUGS

This listing of new products is based on information received from Dean F. N. Hughes, Faculty of Pharmacy, University of Toronto, and the *Canadian Pharmaceutical Journal*, to whom we owe thanks.

HORMONES

Dexamethasone 21-Phosphate with Neomycin Sulfate: NEODECADRON (Pr), N.S.D.

Description.—Topical Cream and Topical Lotion contain 0.1% dexamethasone 21-phosphate (as disodium salt) and neomycin sulfate U.S.P. 0.5%.

Indications.—Nonspecific anogenital pruritus, allergic dermatoses such as contact dermatitis and atopic dermatitis, disseminated neurodermatitis, pruritus with lichenification, eczematoid dermatitis, infantile eczema.

Administration.—Apply small quantity of Cream or Lotion 2 or 3 times daily.

How supplied.—Cream, tubes 5 g. and 15 g.; Lotion 15 c.c. plastic squeeze bottle.

ANTIBIOTICS

Penicillin: BROCSIL (BRL 152) (Pr), Beecham

A synthetic penicillin — (α-phenoxyethyl) penicillin.

Description.—Potassium salt of 6-(α-phenoxypropionamide)—penicillanic acid, tablets of 125 mg. and 250 mg. Reported to be fully effective orally, yielding higher blood levels than after intramuscular penicillin G.

Indications.—Infections caused by penicillin-sensitive micro-organisms, e.g., pneumococci, streptococci, gonococci, corynebacteria and penicillin-sensitive staphylococci.

Administration.—125 mg. or 250 mg. 3 times daily, according to the infection.

How supplied.—Bottles of 12 and 100.

Penicillin: SYNCILLIN (Pr), Bristol

Description.—Potassium penicillin 152 (potassium (α-phenoxyethyl) penicillin), a synthetic molecule freely soluble in water and resistant to decomposition by acids. Tablets of 125 mg. and 250 mg.

Reported to be fully effective by the oral route, yielding higher blood levels than with potassium penicillin V and intramuscular penicillin G.

Indications.—Infections caused by pneumococci, streptococci, gonococci, corynebacteria and penicillin-sensitive staphylococci.

Administration.—125 mg. or 250 mg. 3 times daily without regard to meals, depending on the severity of the infection.

How supplied.—Bottles of 12 and 100.

PHENOTHIAZINE DERIVATIVE

Trimeprazine: PANECTYL (Pr), New presentation, Poulenc

Description.—D,1-10-(3-dimethylamino-2 methylpropyl)-phenothiazine, an antipruritic, antitussive and antidyspnœic, 5 mg. per ml., 5 ml. ampoules (boxes of 10 and 100) and 10 ml. multidose vials, for deep intramuscular injection. Also in 2.5 mg., 5 mg. and 10 mg. tablets, bottles of 500 and 1000.

MISCELLANEOUS

Infant formula product: ENFALAC Powder, Mead Johnson

Description.—Patterned after human milk, is made from nonfat milk, lactose, oleo, corn and coconut oils and soy lecithin, with added vitamins and minerals.

Caloric distribution consists of 9% from protein, 50% from fat and 41% from carbohydrate as compared with 7%, 51% and 42% respectively in average human milk. Curd tension is practically zero.

Indications.—Day-by-day feeding of full-term infants; feeding of premature infants; supplementary use with breast feeding; feeding of infants with poor tolerance to milk fat.

Administration.—Mix with water, bottle and feed. Normal dilution—1 level measure to 2 oz. water, or 1 level measuring cup to 32 oz. of water; supplies 20 calories/fl. oz.

How supplied.—1 lb. cans with measuring scoop.

Hexadimethrine bromide: POLYBRENE SOLUTION, 100 mg. ampoules, Abbott

Description.—Each ml. contains: hexadimethrine bromide 10 mg. in an isotonic aqueous solution. Heparin neutralizer.

Indications.—Indicated whenever heparin is to be neutralized: after cardiac surgery involving extracorporeal circulation, after accidental overdosage of heparin, and when emergency surgery is necessary in a patient on heparin therapy.

Administration and Dosage.—Should be diluted before use and administered slowly intravenously. Recommended dose is 1 mg. for each 100 U.S.P. units of heparin. It is suggested that the required quantity of solution be diluted with saline or dextrose solution to give a final concentration of 1 mg. Polybrene per ml. Each dose should be administered slowly in a period of 10 to 15 minutes.

How supplied.—Boxes of 5 and 25, 10-ml. ampoules.

Solvent for renal calculi: RENACIDIN, Shield

Description.—Water-soluble, sterile, white powder, composed primarily of lactones, anhydrides, and acid salts of gluconic, citric and malic acid. pH 4 in concentration of 10%. Does not appear to irritate kidney or bladder in 10% solution, yet reduces renal and bladder calculi.

Indications.—Preliminary clinical report suggests may prove useful to reduce to removable size renal and bladder calculi of the "soft" type composed primarily of tribasic calcium phosphate, magnesium ammonium carbonate, or calcium carbonate; to prevent calcification of indwelling drainage catheters; for use in treatment of alkaline encrusted cystitis; etc.

Administration.—By irrigation utilizing continuous slow drip preferably, following detailed instructions, using 5 to 10% solutions.

How supplied.—Bottles of 300 g.; boxes of 6 bottles of 25 g. each.

Heparin sodium: PANHEPRIN IN SALINE, Abbott

Description.—2000 U.S.P. units heparin sodium in 30 ml., in 500-ml. silicone-coated bottle (non-vac) for heparinization of 470 ml. blood for extracorporeal circulatory purposes.

2000 U.S.P. units heparin sodium in 30 ml., in Pliapak 500 ml. for heparinization of 470 ml. blood for extracorporeal circulatory purposes.

1500 U.S.P. units (15 mg.) heparin sodium in 30 ml., in silicone-coated bottle (Abbo-Vac), 500 ml. for heparinization of 470 ml. blood for extracorporeal circulatory procedures.

1800 U.S.P. units (18 mg.) heparin sodium in 30 ml., in silicone-coated bottle (Abbo-Vac), 500 ml. for heparinization of 470 ml. blood for extracorporeal circulatory procedures.

SUPASA Rectal Suppositories (Adult), Can. Pharm.

Description.—Each lemon-coloured suppository contains 5 grains (320 mg.) of acetylsalicylic acid in a special water-soluble base.

Indications.—For analgesic effect when rectal administration is desired.

How supplied.—Vials of 12.

SUPASA Rectal Suppositories (Infant), Can. Pharm.

Description.—Each lemon-coloured suppository contains 1.66 grains (105 mg.) of acetylsalicylic acid in a special water-soluble base.

Indications.—For analgesic effect in infants when rectal administration is desired.

How supplied.—Vials of 12.

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REVIEW ARTICLE

CALCANEAL FRACTURES*

A. M. DAVIDSON, M.D.,† *Whitehorse, Yukon*

CONSIDERABLE controversy still exists in different circles as to the method of choice in treating calcaneal fractures. This is especially true in cases in which there is crushing of bone with involvement of the subtalar joint. The treatment of choice will be evident only after thorough statistical analyses of methods and results are available. A noteworthy contribution to the literature is that of Arne Arnesen[1] based on a ten-year follow-up of patients treated by closed reduction and traction at Tröndheim, Norway. From knowledge now available it should be possible to type each fracture and apply a specific treatment most likely to give best results for that case.

This author classifies calcaneal fractures as either extra-articular or intra-articular. The latter has three sub-types: (a) the tongue-type fracture, (b) the depression-type fracture, and (c) the stamp-type fracture. To use the tuber-joint angle as an indication of the severity of the fracture is misleading in the tongue type, and probably a more reliable indication would be obtained by measuring the height and width. It is necessary to take dorso-plantar radiographs of the anterior aspect of the calcaneus in order to be able to assess the extent of the fracture. In 25 out of 27 patients examined by Arnesen, the fracture line extended forward into the calcaneo-cuboid joint.

The relationships of the posterior subtalar joint are of decisive importance for prognosis. With all the variations that occur, these three characteristic and well-defined patterns are distinctive and form the basis of classifying into the groups recorded in this paper.

In the tongue type of fracture, the joint fragment is united with the superior part of the tuberosity and may be tilted into place by using the tongue and a Gissane spike as a lever.

The characteristic feature of the depression-type fracture is that the joint surface stands parallel to the joint surface of the astragalus on lateral view. In axial view it is parallel or tilted slightly medially. The body is comminuted into a mosaic of fragments but when restored the joint fragments will remain in correct position. The stamp type is really a compression fracture, where the joint fragment has not only been pressed downward parallel to the astragalar joint surface but also "stamped" more or less deeply into the underlying spongy bone. Because of the similarities of these two fractures, some authorities claim that the latter is more severe but essentially the same lesion. However, because of the severity, this type cannot be satisfactorily reduced by closed reduction. In spite of the fact that there are a number of variations within the groups, most of these fractures can fit into the general classification outlined. Some cases of severe crushing fractures cannot, because of their severity, be classified in any of the above types.

In the past, these fractures have been poorly understood, probably primarily because of the various types that might occur. Often x-ray examination is inadequate and, unless special techniques are used, the exact nature of the fracture is often not realized. The classification of Warrick[2] has done much to improve our understanding of this subject. Various radiographic projection techniques have also helped to elucidate the problem. One of the greatest advances is probably the technique laid down by Anthonsen,[3] in which he describes the method of obtaining axial radiograms.

If the x-ray tube is tilted to 45 degrees below the dorsiflexed foot so that it becomes parallel with the posterior compartment of the subtalar joint, the various details of the joint and of the region of the sustentaculum tali are clearly defined. However, in spite of the various techniques described, it is evident from their multiplicity that the best method probably still has not been arrived at for treating fractures of the os calcis. Before proceeding to the treatment of these fractures it is important to realize the exact pathomechanics and damage that exists, for in some types conservative treatment gives relatively poor results. Cases of intra-articular fracture with displacement are notorious in this respect and probably half of these patients, in some series, are unable to resume their previous work. However, certain types such as fractures of the sustentaculum, those of the anterior end of the calcaneum and fractures of the calcaneum without displacement do lend themselves to conservative therapy.

As Essex-Lopresti[4] pointed out, it is essential to differentiate between the tongue type in which the displaced joint fragment can be manœuvred with the long lever, and the joint-depression type where the displaced fragment buried in the body of the bone can be reduced only by an open approach. Good results are likely to be obtained with manipulative reduction and immobilization in those cases where the outer part of the articular facet is displaced. In spite of these generalities, there is no agreement amongst the authorities regarding the types of fracture amenable to closed reduction. With this in mind, Arnesen has tried to elucidate the problem by reviewing previous publications and studying his own material. The study is based upon analysis of all fractured calcanei admitted into his department from 1947 to 1956 inclusive—a total of 67 cases, ten of which were bilateral fractures, making a total of 77 frac-

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tures. Practically all of these cases were treated by closed reduction in traction.

An attempt is made to mould the lateral wall into place. The foot and the calcaneus may be pressed in with the aid of the clamp and felt padding. Traction is gradually reduced by approximately one kilogram weekly to three kilograms which is maintained for five to six weeks. Ordinary fractures of the calcaneus heal rapidly and become stable in five to six weeks. The author does not now employ plaster of Paris bandage once traction is removed but insists on exercises without bandages and without weightbearing. Ten to 12 weeks after the accident, the patients are allowed up with zinc and gelatine dressing and inlay soles.

In the stamp type of fracture the joint surface fragments usually remain unchanged and are pressed into the underlying spongy bone. Their articular surface is visualized in the radiograph as a white sclerotic line, which decreases gradually but sometimes is still visible after the lapse of 10 years. As would be expected, results in these cases are often far from satisfactory. In spite of this the author maintains that this method gives fairly reliable subjective results with adequate support for the astragalus in good position and good axis. Subsequent changes in the joint surface may be an indication for arthrodesis. It is interesting to note that in this series the duration of incapacity for work varied little in the different groups, the longest period being 10 months. Most patients appear to improve rapidly for about one year after the accident, and then more slowly for another year. The most common complaint was of pain on walking.

Arnesen maintains that reduction with the aid of traction in the metatarsals and longitudinal countertraction in the direction of the leg, compression by clamp and maintenance by traction have given good results in the majority of cases. The tongue-type fracture has, however, been an exception to this. In the majority of cases of stamp-type fracture with severe displacement, reduction of the joint surface to normal was not achieved. Nevertheless, the subjective result was satisfactory in the majority of these cases, probably because with the aid of traction it had been possible to obtain good axis, good support for the astragalus, good general shape of the body and good length of the tuberosity.

Conservative treatment is satisfactory only in a proportion of the very mildest cases, and cases with definite displacement should be treated by reduction and traction. Closed reduction and traction is the most suitable treatment for fractures of depression and slight stamp type. However, the severe fracture of the stamp type requires operative intervention.

Essex-Lopresti concluded that fractures of the os calcis in patients over the age of 50 were best treated conservatively, while those in persons under 50 were treated best by operative means.[4] This is contrary to the opinion of Lindsay and Dewar.[5] Their survey showed that the greatest percentage of good results lay in the conservatively treated group. From a study of their material it would appear, in contrast to the current consensus, that even most cases with severe deformity may do better without surgical arthrodesis.

Arnesen stresses the point also that incision and approach must be chosen in such a way that the lateral wall is spared and utilized. Also the normal axis and correct calcaneal shape have to be secured and maintained by traction and countertraction. The incision is placed well backwards to avoid the sural nerve between the Achilles tendon and the fibula. It is extended down to the superolateral border of the tuberosity where the hæmatoma is usually met. By adding traction on the wire, a better view of the joint and fragment is obtained. A joint fragment which is pressed medially into the spongy bone may be grasped with a hook and pulled backwards and laterally.

In some cases a primary subtalar arthrodesis may be indicated but the axis should be good and general shape satisfactory to ensure correct relation to the adjacent joint and bones. Triple arthrodesis does not give enough satisfactory results to warrant its being considered as a primary form of treatment. Subtalar arthrodesis is considered suitable as a secondary procedure where primary intervention has failed. Operation should be carried out early to avoid secondary changes. This series would suggest that secondary triple arthrodesis is a useful procedure where other treatment has failed and often produces relatively good results with capacity for work. A high percentage of satisfactory results was obtained with active treatment, and practically all patients have become fit to return to work and able to lead a fairly normal life despite various complaints and discomforts.

In treating these fractures, three important points must be remembered. First of all, the posterior joint surfaces and thereby the mobility of the subtalar joint must be restored. Secondly, because the astragalus supports the entire body weight, it must be supported in the correct position and in the correct axis. Thirdly, in view of the function of the tuberosity as a lever of muscle, its position must be considered. Under all circumstances, reduction of the posterolateral corner is a salient point. Shearing and avulsion fractures present no problem and are most satisfactorily handled in walking plaster; in the latter, it is important to remember the possibility of simultaneous rupture of the Achilles tendon. The tongue type of fracture does not lend itself to treatment with traction; most successful results were obtained by moving the tuberosity of the tongue with the joint fragments into place under maintenance of traction with the aid of a Gissane spike. The joint fragment is reduced under fluoroscopy. Side-to-side compression is applied to the calcaneus with a

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Böhler clamp while the assistant maintains slight pressure on the spike. After removal of the spike, traction and countertraction on each wire is reduced to five or six kilograms. Arnesen is also under the impression that the Gissane technique is more effective than the use of the spike combined with traction. He makes the point that the spike must be placed parallel to the upper border of the tuberosity in order not to put too great a force on the lever and cause over-reduction. The method of treating depression-type fractures by traction with two wires through the metacarpal and through the tuberosity of the calcaneus after reduction sounds theoretically well worth a trial. Countertraction through the metatarsals and also through the long axis of the leg by elevation of the foot of the bed is important. The wire in the tuberosity is placed in the supero-posterior corner.

Summarizing the treatment of intraarticular fractures, Arnesen feels that reduction with the spike, compression and traction are best for the tongue type. On the other hand, traction-manipulation and traction are preferable for the depression type. In severe cases of stamp fracture, traction-manipulation and open reduction under traction followed by traction are advocated.

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LETTERS TO THE EDITOR

PUCK ANEURYSM

To the Editor:

Just recently I received by way of a Christmas greeting a comment from a friend of mine upon "Puck aneurysm" (*Canad. M. A. J.*, 81: 922, 1959). This comment is, "I believe puck aneurysm to be morphologically similar to rolling-pin-periarteroma* portrayed on numerous occasions by McManus in 'Bringing Up Father'." I hope this friend will remain a friend if I disclose that once in answer to an examination question reading "What may invalidate Courvoisier's Law" he answered, with admirable brevity, "Madame Courvoisier".

J. S. CAMPBELL, M.D.
General Hospital,
Bruyère Street,
Ottawa 2, Ont.,
December 20, 1959.

*There is not, so far as I know, any such lesion recorded in the medical literature. It is reassuring that one need not seriously advocate the use of protective helmets in the management of "la crise domestique".

WOUNDS OF THE MYOCARDIUM

To the Editor:

The case reported in your December 15 issue (81: 1014, 1959) by Drs. Westgate and Jones from Vancouver is indeed a fascinating article. The case was obviously well handled by aggressive and highly talented men. Penetrating wounds of the heart with survival following repair is always dramatic for all concerned and rewarding to the surgeon who succeeds.

The first paragraph, however, erroneously states that British literature has but four cases reported in recent years and this reference is to Bell, L. C.: *Brit. M. J.*, 1957.

It seems to me sad (almost unpatriotic!) that you let this remark pass in view of my own article published in this very same journal (*Canad. M. A. J.*, 75: 824, 1956) just over three years ago, which reported two such cases with survival.

J. D. HAYNES, M.D.
Suite 2, Oakville Medical Centre,
31 Sheddon Ave.,
Oakville, Ont.,
December 21, 1959.

[*Through one of those lapses of memory which afflict editors, we must confess to a sin of omission in overlooking Dr. Haynes's paper. We apologize for our error.*—ED.]

THE SILENT SCOTSMAN

To the Editor:

Your brilliant editorial review of André Maurois' "Life of Alexander Fleming" revived for me a number of memories. As a Temporary Lieutenant, R.A.M.C., I met Fleming on a number of occasions in the winter of 1914-15 and Maurois later in 1915, when he was "interrupter" at No. 29 Field Ambulance. I was a surgeon at No. 11 General Hospital at Boulogne, Fleming at No. 13 (the Casino), pathologist under Sir Almroth Wright. Our pathologist, S. W. McLellan, went to France on the same transport as I, and by coincidence we kept being posted to one another's units throughout the war. McLellan, though latterly a junior medical consultant at Liverpool Royal, had established a reputation as a pathologist by being the first to cultivate the malarial parasite—he used to be quoted in "Muir & Ritchie" in this respect. We used to go along to the Casino for an hour or two's discussion with Sir Almroth, and with Fleming. As Maurois and you indicate, Wright was extremely dictatorial, while Fleming's sense of loyalty made it difficult for him to be critical of Wright's *obiter dicta;* the meat of the discussions did not arrive until he had gone to bed; then we found Fleming was doubtful of Wright's teardrop lysin theory, and was actually opposed to the famous salt-pack dressing, which in our opinion killed more patients by completely dehydrating them than it cured by promoting wound discharge. But then, Wright was no clinician; on one occasion after he had spent half an hour over a patient of my own, I asked our consulting surgeon what he thought of the consultation. In a quiet voice,

Sir George Makins replied that "Sir Almroth appears to have discovered *de novo* the imperative necessity of establishing drainage in suppurating wounds." Fleming, battling hard for his side, said that what Wright had done was to point out that the pus drained from the pelvic aspect of an infected hip joint, a fact of which we were but too well aware.

Both pathologists were men of devotion, tremendous workers, always anxious to do anything to help, but by no means devoid of a sense of humour. Among a bunch of specimens we sent to McLellan for histology for identification, we included a piece of cheese (there were at the time rumours of a new German projectile which was alleged to have a delayed action in the wound promoting gas gangrene). After prolonged section-cutting and microscopy, McLellan resolved the specimen; his fury was understandable, but a few days later, he persuaded the Casino boys to play the same trick on Fleming, who after much unproductive labour, took this queer specimen to McLellan. His revenge took the form of introducing Epsom salts into the mess coffee, which unfortunately Sir Almbroth imbibed; it led to a search for the organism which was causing the dysentery.

Later in 1915, McLellan, tired of the humdrum of what was now routine pathology, got himself posted to No. 29 Field Ambulance, where André Maurois was. I spent two nights with them, and never have I been privileged to hear conversation as brilliant, as widely ranged, and as thought-provoking. Maurois was writing "The Silence of Colonel Bramble" and much of these discussions enter into the book; but his second book "Les Discours du Dr. O'Grady" is very largely Sam McLellan.

Mac not only foretold Maurois' literary distinction, but in a way Fleming's penicillin discovery. I well remember a talk between them, when McLellan said "What we want is some drug which will do for the bacteria and cocci what Salvarsan does for the spirochætes — destroy them in the body, and you, Fleming, are the chap to find it." I have wondered whether this advice subconsciously influenced Fleming in later years.

Maurois I never met after the war, Fleming once or twice in London, the same unassuming genius with a twinkling eye. McLellan and I ended as officers in charge of the medical and surgical divisions of the same general hospital. He died tragically of septicæmia when on a prolonged honeymoon in 1919.

W. GRANT WAUGH, M.D.

Box 756, Drayton Valley,
Alberta,
December 22, 1959.

ABC ELECTROCARDIOGRAPHY

To the Editor:

In his letter of October 28 (*Canad. M. A. J.*, 82: 43, 1960) Dr. Wolinsky invites criticism of the ABC tridimensional system on theoretical grounds. One of its most obvious defects results from neglect of an elementary rule in the design of a bipolar lead, namely, that the two electrodes must be electrically equidistant from the heart. If they are not, the effective electrical axis will differ from the anatomical axis in a degree that reflects the degree of asymmetry. In the ABC system, the xiphisternum is much closer to the electrical centre of the heart than is the mid-axilla; as a result lead LX, or B, from mid-axilla to xiphisternum, although anatomically transverse, has an elective electrical axis that is directed mainly forward. Complexes recorded by lead B are therefore very similar to those of leads V_1, V_2, or VE, and in most cases are almost identical with one of these three, whereas they bear little resemblance to leads I or V_6. I have taken lead B in patients with large lateral wall infarcts and have failed to record any diagnostic evidence of the lesion; on the other hand, anteroseptal infarcts which should theoretically have little representation in a transverse lead are usually very well demonstrated in lead B.

The same criticism applies in somewhat lesser degree to the vertical lead MX, or A, from manubrium to xiphisternum. Indeed, of the three ABC leads, only the postero-anterior lead RX, or C, has an effective electrical axis that is reasonably close to its anatomical axis. Thus instead of a truly tri-dimensional system, what we actually have is one with a fairly satisfactory sagittal lead, a less than satisfactory vertical lead, and a so-called "transverse" lead that is almost completely useless for the recording of the transverse component of the cardiac vector.

Numerous experimenters have demonstrated in the past few years that even the most thoughtfully planned orthogonal lead systems using only four electrodes are subject to serious distortion of the effective electrical axes. It has been found that no fewer than seven electrodes, with balancing resistors interposed, are essential to provide a three-dimensional system with acceptable correction of mean directional deviation of the three axes.[1-7] This would effectively eliminate any "simplified" methods, even those as relatively sophisticated as Grishman's cube system or Wilson's tetrahedron, not to mention a system as crudely conceived as the ABC.

With reference to Dr. Wolinsky's suggestion that it is not proper to compare bipolar with unipolar leads, it has been shown in torso model experiments that both suffer equally from the discrepancy between anatomical and effective electrical axes, but are perfectly comparable with respect to the projection of the cardiac vectors upon their effective axis.[8]

On a more empirical level, one would like to know whether a flattened or negative T-wave in a given lead is normal or abnormal. In the case of lead B, Trethewie states (and I have confirmed) that in 50% of normal subjects the T-wave is negative, in the other 50% positive! To add to its other disadvantages this lead does not employ the conventional polarity; vectors directed leftward produce negative instead of the customary upward deflections.

One other objection of Dr. Wolinsky remains to be answered. He points out that lead C does not resemble lead V_6. This is perfectly true, since lead C is a postero-anterior lead and V_6 is a transverse lead in the horizontal plane. The sentence in the editorial which reads "Leads B and C correspond closely to leads V_2 and V_6" should be amended to read: "Leads B and C correspond anatomically to leads V_6 and V_2 respectively." This represents a slip of the pen, comparable to the one that makes Dr. Wolinsky say in his letter: "Lead B does resemble lead V_2 as it is taken in an anterior horizontal plane." Lead B is in fact not taken in an anterior horizontal plane but in a transverse horizontal plane; anatomically it does not resemble V_2, but rather V_6 or I.

In conclusion, my concern is no less great than Dr. Wolinsky's lest a promising technique be set back or

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even lost to scientific progress by premature or thoughtless criticism. If Dr. Wolinsky will record a few dozen ABC electrocardiograms and in particular a few dozen B-leads, I think he will be convinced that science has long since marched past the stage at which these leads might have proved a useful link in the evolution of electrocardiography. "YOUR COMMENTATOR"
December 23, 1959.

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"WE WISH WE HAD WRITTEN THAT"

To the Editor:

In my wanderings through old medical journals, I sometimes come across items which suggest to me that the *Canadian Medical Association Journal* might start a new department entitled "Items we wish we had written". One such appears in the *British Medical Journal* of June 25, 1881, and refers to Dr. William Beaumont's famous patient, whose life and death I described in a recent issue of the Journal—"Alexis St. Martin, of immortal story, is dead, as we read in the *New York Medical Record*, and his gastric fistula is closed forever."

E. H. BENSLEY, M.D.

The Montreal General Hospital,
Montreal 25, P.Q.,
December 23, 1959.

[*We invite submission of "items we wish we had written," from the whole field of medicine. Anyone who has a favourite aphorism or paragraph is invited to send it in.*—ED.]

WHY SUCH APPREHENSION OVER SHOCK TREATMENT?

To the Editor:

In answer to Dr. Dobkin's letter (*Canad. M. A. J.*, 81: 1034, 1959), I agree that the use of ECT is not without risk, but comparing my experiences with those of colleagues both here in Alberta and in Ontario, it would still appear that many, many thousands of such treatments have been administered, with a very low incidence of complications. A multitude of reports in the literature appear to be written in the same optimistic vein.

The theme of the article in question, however, is directed at the needless fear and misunderstanding harboured by the general public and many medical colleagues about the *nature* of this type of therapy, and the reasons for its use.

HERBERT PASCOE, M.D.

Department of Psychiatry,
University of Alberta Hospital,
Edmonton, Alberta,
December 28, 1959.

INCIDENCE OF NEOPLASTIC DISEASES IN CANADIAN ESKIMOS

To the Editor:

The incidence of neoplastic diseases in Canadian Eskimos was briefly discussed in my article in the *Canad. M. A. J.* (8: 390, 1959). I have received many letters expressing particular interest in the reported incidence of the different tumour types, their regional distribution and the explanations offered. The material available to me before publication was naturally very limited and it is hoped that a more extensive study will soon be undertaken with the assistance of the offices in possession of more complete statistics.

Seven more cases of neoplastic diseases seen in Charles Camsell Indian Hospital in Edmonton from 1950 to 1959 inclusive came to my attention in the meantime. All cases from this hospital were proved by histological examination by Dr. S. Hanson, associate professor of pathology, University of Alberta.

The seven cases not included in my previous series of 25 neoplasms in Canadian Eskimos proved to be: two hypernephroma — both patients came from the Central Arctic as did the one reported in my previous series; one retinoblastoma — Central Arctic; one pituitary carcinoma — Eastern-Central Arctic; one carcinoma of ovary — Central Arctic; one mixed tumour of parotid gland — Central Arctic; one adenocarcinoma of rectum — Aklavikeskimo of Alaskan origin. Several other cases—e.g. retinoblastoma in a girl of mixed white-Indian parentage, and carcinoma of the œsophagus in an Eskimo of Alaskan origin—are not included because they did not concern pure-blooded Eskimos or were not histologically proved.

The seven new cases show again the previously noted prevalence of tumours due to developmental dysgenesis, six out of the seven falling in that group.

The 32 histologically confirmed neoplasms so far reported by me in pure-blooded Canadian Eskimos can be grouped as follows: eight tumours of the parotid gland (benign and malignant); three hypernephromas; three carcinomas of the lower intestinal tract; three œsophageal carcinomas (two purely œsophageal, one œsophageal-cardia carcinoma; two skin carcinomas; two lung carcinomas; two cervix carcinomas; two ovarian tumours (one dermoid cyst, one carcinoma); one chorionepithelioma; one retinoblastoma; one pituitary carcinoma; one carcinoma of urinary bladder, one carcinoma of gallbladder, one lymphoma (Hodgkin's).

This list is as conspicuous for the unusual predominance of mixed tumours of the parotid gland and other dysgenetic tumours, which account for the majority of all neoplastic diseases in Eskimos, as for the absence of some of the commonest neoplasms in whites such as carcinoma of the breast and prostate, i.e. those most obviously influenced by endocrine factors (see my previous discussion of hormonal balance in Eskimos). It may also be noted that all patients with parotid tumours, hypernephromas and other dysgenetic tumours came from the Central Arctic and most of them from the eastern and southeastern parts of the Central Arctic (Caribou, King William Island and Spence Bay Eskimos). There the incidence of neoplastic diseases appears to be up to 20 times (Caribou Eskimos) that of the Eastern and Western Arctic Eskimos.

These areas around and south of the magnetic pole happen also to be known for their greatest intensity of "northern lights", and a correlation with the striking

incidence of dysgenetic neoplasms was therefore suggested in my previous publication. I have received several letters directing my attention to American publications reporting reproduction of the aurora borealis phenomenon around the north and south magnetic poles after atomic explosions in and above the higher atmosphere and explained by an inflow of electrons into our atmosphere from outer space in direction to the magnetic poles.

The small numbers presented in my study are very questionable evidence indeed, but the increasing importance of the areas involved as well as the possible growing incidence of man-made "northern lights" warrants nevertheless a close study of the posed questions.

OTTO SCHAEFER, M.D.

12815 - 116th Avenue,
Edmonton, Alberta,
January 2, 1960.

PUBLIC HEALTH

CANADIAN APPOINTED PUBLIC HEALTH STATISTICIAN

The Pan American Health Organization has announced the appointment of Dr. Robert Kohn of Ottawa as a consultant in public health statistics. He will be PAHO's official consultant in public health statistics to the health administrations of Venezuela and the islands of the Caribbean associated with France, the Netherlands, the United Kingdom and the United States. His duty station will be Kingston, Jamaica.

From 1948 until this appointment, Dr. Kohn was chief of the Public Health Section of the Dominion Bureau of Statistics in Ottawa.

PROVINCIAL NEWS

QUEBEC

The annual meeting of the Quebec Division of the Canadian Cancer Society was held at St-Jérôme, Que., on December 4 and 5. Representatives from all 50 sections scattered throughout the province attended. The medical section meeting was presided over by Dr. Louis Charles Simard, director of the Montreal Cancer Institute. The delegates reviewed the work of the Society during the past year and there was much discussion on co-ordinating plans for the extension of work in education, welfare and research in 1960.

On November 25, and on the occasion of the 50th anniversary of the Royal Edward Laurentian Hospital in Montreal, the medical staff of the hospital presented a "clinical evening" for the benefit of the medical profession in Montreal. This was under the patronage of the Honourable Dr. Arthur Leclerc, minister of health for the province of Quebec, and the presentation was in the form of exhibits. The first 10 exhibits featured the role of the Royal Edward Laurentian Hospital for the control of tuberculosis in the community. Ten additional exhibits emphasized that with the decreasing need of beds for tuberculosis it was only natural that the nucleus of specialized staff and facilities be maintained and utilized for the treatment of non-tuberculous chest diseases. Because of this, a separate unit of 50 beds was opened for this purpose in 1957. It was on October 21, 1909, that King Edward VII, in England, pulled an electric switch which opened the doors of the first Royal Edward Laurentian Hospital, then known as the Royal Edward Institute. This switch formed part of the present exhibit. Because of the significance of this event it was indeed a great pleasure to see so many of our French-speaking and English-speaking colleagues present.

Dr. Hugh Burke, director of the hospital, and his staff are to be congratulated on the excellence and high quality of the program presented.

The Grace Dart Hospital for the treatment of tuberculosis in Montreal has just completed a public appeal for some $93,000. This hospital was founded in 1898 and provides full active treatment utilizing modern surgical and medical techniques. Throughout its history the services have been free of charge to any sufferer from tuberculosis, regardless of race or creed. Part of the present plight of the institution stems from the fact that treatment is becoming more and more successful, thus reducing the number of patients, while the maintenance costs of the institution either remain the same or increase. Support from government sources amounts to only $5 per patient per day.

During the week of November 22, the Quebec Hospitals Committee held a one-week course on hospital administration at the Jeanne Mance Pavilion of the Hôtel-Dieu Hospital in Montreal. This course, inaugurated this year, seems to have been most successful. The aim was to extend the teaching of hospital administration in line with modern medical practice and centred on the Christian philosophy of medical care. Medical directors from six Quebec hospitals and the medical director of the General Hospital in Ottawa attended the course and were granted diplomas.

On December 4, the New England Cancer Society held a one-day meeting at the Royal Victoria Hospital in Montreal. More than 40 members participated in this "away from home" annual meeting. The scientific program had been arranged by Dr. H. S. Morton at the Royal Victoria Hospital and consisted of some 18 individual presentations by physicians from Montreal, including your reporter. The sessions closed with cocktails and dinner at the Queen Elizabeth Hotel. It was an exceedingly pleasant and informative day in company with a delightful membership.

The last 1959 meeting of the Montreal Medico-Chirurgical Society was held on December 7, at Queen Mary Veterans Hospital with Dr. Joseph E. Murray of the Harvard Medical School and the Peter Bent Brigham Hospital, who spoke on "Transplantation of organs". He reported on kidney transplantation between 13 pairs of identical twins, and the experience in three homotransplants between unrelated persons after total body irradiation and bone marrow infusion.

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Remarkable success has been achieved in transplantation between identical twins. So far, this has not yet been possible in homotransplantation between unrelated humans. Theoretically the immunological barrier preventing successful transplantation of viable organs can be overcome by two or possibly three mechanisms. The first involves the use of total body irradiation to the intended recipient, followed by bone marrow infusion and a graft from the marrow donor. A second method involves the production of "immunological tolerance" by the exposure of the intended recipient to an antigen early in embryonic or neonatal life. The third method involves the use of "enhancement", an experimental tool valuable in tumour transplantation but less easily applied to the transplantation of normal tissues. All three methods of investigation are being pursued. The first has been tried in humans but so far with little, if any, success. Two such patients, one in Boston and the other in Paris, are now being studied. Transplants appear to have had "temporary" success, "but it is much too early to say that they represent a practical method of getting around a protective mechanism on a long-term basis".

It would seem that at present transplantation of an organ which must live and function by cellular activity is possible only between identical twins. This does not apply to the transplantation of a cornea or of bone and blood vessels, now fairly common in surgery. This is because these latter organs function purely "mechanically". They do not become part of the cellular functions of the host body.

Dr. C. A. Roberts, medical superintendent of Verdun Protestant Hospital and assistant professor of psychiatry at McGill University, left Montreal on December 5 for Mexico City. At the request of the World Health Organization, Dr. Roberts will conduct a survey of Mexico's health facilities and then present a report which will incorporate a summary of present services and recommendations for future developments. This undertaking is being carried out as a result of a request from the government of Mexico.

A. H. NEUFELD

NEW BRUNSWICK

The Madawaska Medical Society honoured two of their members in November who have completed 50 years in the practice of medicine. Dr. D. J. Albert was master of ceremonies. Dr. G. E. Gauvin in toasting Dr. D. C. Laporte, Madawaska County medical officer, mentioned his success in medicine and in arts, photography, modelling and wood carving.

Dr. Honoré Cyr of St. Basile, proposing the name of Dr. A. M. Sormany, said that this doctor still carried on a busy office practice and related his work for music, the Assumption Society and the Acadian Education Association.

Both honoured guests received commemoration plaques presented by Dr. Denis Stein, president of the local society. Congratulatory messages were received from Dr. Paul Melanson, president of the N.B. Medical Society, and Dr. Arthur Melanson, Deputy Minister of Health.

Dr. Walter Leslie, Halifax neurologist, was the visiting speaker at the November "clinical day in the Hospital" at Saint John in November. Dr. Leslie conducted ward rounds in the Lancaster D.V.A. Hospital and in the Saint John General Hospital. These rounds with discussions are for medical staff, interns and visiting physicians.

Dr. Leslie discussed "Virus diseases of the nervous system" at a general meeting held in the auditorium of the Pathological Building in the afternoon. This series of meetings commands a continuing interest.

Dr. Herbert F. Owen of the surgical staff of the Montreal Children's Hospital visited Fredericton, Grand Falls and Campbellton on three successive days, November 24, 25 and 26, and addressed the three local medical societies on "Points in diagnosis and management of surgical conditions in children". Question-and-answer periods at these meetings provide opportunity to discuss current cases and are of much help to attending doctors. Dr. Owen's visit was enjoyed and much appreciated. Perhaps we see too little of our Montreal and Quebec friends in the Maritimes.

Dr. Aubrey Densmore Hudson has been appointed director of the Provincial Regional Laboratory at Campbellton. He is certified in pathology. He was born in New Brunswick and left school with a grade eight standing in the depression of the thirties. He worked as a merchant seaman until he enlisted and served with the R.A.F. and R.C.A.F. for six years. On demobilization, he attended No. 4 C.V.T. government-sponsored school at Moncton and completed grades nine, ten and eleven in seven months. His pre-medical and medical course was completed at Dalhousie University. He won a series of R.C.A.F. "Wings" scholarships and a Dalhousie Entrance Scholarship for medicine for New Brunswick in 1949, a B'nai B'rith prize in 1949 and a Frosst Bursary in 1952. He took an active part in student affairs. After graduation, he studied in Birmingham University, England, on a university fellowship in pathology, then was a resident at the Saint John General Hospital, Saint John, N.B., in pathology, followed by a return to England to work in London for a year. His final appointment before certification was as a resident in clinical pathology at the Montreal Children's Hospital. Sometime during this busy schedule he acquired a clever wife and two children.

This reporter—more blasé than naïve—thought that this story would be of interest to the many doctors who may have thought that their own struggles were the most.

A. S. KIRKLAND

NOVA SCOTIA

Construction of a 331-bed addition to the Halifax Infirmary is expected to begin shortly, Sister Catherine Gerard, Hospital Administrator, has said. The closing date for tenders was December 10.

The start of construction of the new wing will mark the beginning of two announced projects to relieve the badly overcrowded hospital facilities of the Halifax area. A 350-bed addition to the Victoria General Hospital is expected to get under way next year.

The new wing of the Halifax Infirmary will include 71 pædiatric beds and a fully equipped outpatient department. The new wing will bring the hospital's total capacity to 481 beds. The wing will include, in addition to the new bed capacity, an operating suite, the outpatient department with its own entrance, new laundry, kitchen facilities and various administrative facilities. Part of the estimated cost of $5,000,000 will be borne by the provincial government, partly by funds being raised by a campaign in the Halifax-Dartmouth area and partly by the Sisters of Charity who operate the new hospital. Architects for the new building are Franco Consiglio of Montreal and Ross McNeil, his Halifax associate.

Dr. Charles Donaldson Chipman was elected a Fellow of the Royal College of Physicians and Surgeons of Canada in pathology at the recent examinations held in Toronto. He is the first doctor in the Atlantic provinces to be so honoured in this specialty.

Dr. Chipman graduated with distinction from Dalhousie University in both science and medicine. At present, he is assistant professor of pathology at Dalhousie and on the active staff of the Victoria General Hospital.

Dr. Cecil Edwin Kinley has been appointed professor of clinical surgery, Dalhousie University. He is the first surgeon to hold this chair. W. K. HOUSE

NEWFOUNDLAND

The general public and the business community in central Newfoundland have responded in admirable fashion to the appeal for funds for construction of a new hospital in Grand Falls. Up to December 12, over $300,000 had been raised. This approaches closely to the goal of $350,000 which has to be obtained from private sources. Provincial and federal contributions will add another $2,000,000.

The new hospital is to have 130 beds. Construction on it is expected to begin in April 1960. It will be located on Circular Road in downtown Grand Falls, near the Exploits River bank, and about one-quarter mile from the Trans-Canada highway.

When this new facility is completed, it will provide most types of medical and surgical care for the local population and obviate the need in many instances for travelling to St. John's.

The second fall scientific convention of the St. John's Clinical Society and the College of General Practice proved to be just as attractive as the first one, which took place last year. Over 70 practitioners from all over the island registered, and many of them stayed to attend the annual general meeting of the College which took place on the final afternoon.

The convention was held on November 2 and 3, and featured clinics and lectures by visiting speakers and by several members of the staff of the General Hospital in St. John's. The visitors were Professor Wayne, Regius professor of medicine at Glasgow University, who is on a Commonwealth tour; Dr. R. A. Gordon of Toronto, who is secretary of the Canadian Anæsthetists' Association; and Dr. Roy Forsey, a native Newfoundlander and now chief of the department of dermatology at the Montreal General Hospital.

The main address of the convention, at the dinner, was given by Prof. Wayne who took as his topic "The changing face of medicine". He followed the development of medicine in the twentieth century with the phase of surgical triumphs, then the phase of therapeutic triumphs, and now to the present time where we reach the stage of medical engineering. He went on to discuss the political and social trends which are leading to new methods of distribution of and compensation for medical care.

For the first time in its history, the Newfoundland Medical Association has budgeted this year for independent office space and for the services of a salaried assistant to the Secretary. The new office, just opened, is in the O'Mara-Martin Building in St. John's.

The Community Hospital at Carbonear now provides a focal point for medical practitioners in the Conception Bay area, and they have been making use of it for monthly scientific gatherings. The first was held on October 20 under the chairmanship of Dr. A. T. Rowe of Carbonear. A case of muscular dystrophy was presented, and a talk on recent trends in orthopædics was given by Dr. A. E. Shapter of St. John's.

A second meeting took place on November 17, with Dr. W. H. Drover of Bay Roberts in the chair. The guest speaker on this occasion was Dr. I. E. Rusted of St. John's, who spoke on the therapy of diabetes, with particular reference to the role of the oral hypoglycæmic agents.

Several physicians in the province were successful in the recent examinations for the certificate of the Royal College. They are Dr. R. MacDonald (anæsthesiology), Drs. G. W. Battcock and H. J. Blackwood (general surgery), Dr. A. M. House (neurology), Dr. R. D. Lawton (ophthalmology), and Dr. B. C. McCann (physical medicine).

Dr. A. B. Colohan has been appointed superintendent of the Sanatorium in St. John's. He had previously been assistant superintendent of the West Coast Sanatorium.

Dr. Finley McKerracher has left Newfoundland for a position with the Hospital Services Commission of New Brunswick. A native of Scotland, he has been here since 1954, first on the staff of the Sanatorium in St. John's, and later as assistant superintendent of the General Hospital. ANGUS J. NEARY

CHANGE OF ADDRESS

Subscribers should notify the Canadian Medical Association of their change of address one month before the date on which it becomes effective, in order that they may receive the Journal without interruption. The coupon on page 21 is for your convenience.

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ABSTRACTS *from current literature*

MEDICINE

Microscopic Enumeration of Mycobacteria in Pulmonary Lesions of Tuberculous Mice.

G. CONGE *et al.*: *Am. Rev. Tuberc.*, 79: 484, 1959.

The authors describe a technique for the microscopic enumeration of lesions and of mycobacteria per lesion in the lungs of mice infected with virulent tubercle bacilli. The results reveal that BCG vaccination does not decrease the number of pulmonary lesions elicited by virulent infections, whereas it can depress profoundly the numbers of bacilli detectable by microscopy in each lesion. Microscopic enumeration of bacilli per lesion could provide a measure of the protective activity of various BCG vaccines. The results obtained by this technique with several different samples of vaccine are compared with those given by survival tests in mice and by enumeration of the viable bacilli in infected tissues.

The authors discuss the possible mechanisms of the protective effect of BCG. They conclude that the immune process elicited by BCG *does not* prevent the establishment and initial multiplication of virulent bacilli in the tissues, but only interferes with the subsequent course of the infectious process.

S. J. SHANE

Clinical and Roentgenological Signs of Collagen Diseases Involving the Thorax.

C. M. NICE, H. N. K. MENON AND L. G. RIGLER: *Dis. Chest*, 35: 634, 1959.

Clinical and laboratory data are cited which may lead one to suspect the presence of a collagen disease, and diagnostic points are presented to aid in the differential diagnosis of the various collagen disorders.

Clinical and roentgenographic manifestations of involvement of thoracic structures by collagen diseases are more common than has been stressed in the medical literature, including such relatively uncommon conditions as dermatomyositis.

Roentgen abnormalities in the chest may quite often lead one to suspect the presence of a collagen disease, and certain combinations or sequential changes may even aid in the differential diagnosis of the various conditions. Such roentgen abnormalities include interstitial pneumonitis, pleural effusion and a nonspecific type of cardiac enlargement, all of which occur with such frequency that these signs may be considered as confirmatory in nature and not usually of great aid in the differential diagnosis of these conditions. Atelectasis is also common, but is not commonly found in patients with scleroderma. Several roentgen signs may occur which are rather nonspecific when considered alone, but which assume increased importance in combination with other signs or when a collagen disease is suspected clinically. For example, bilateral hilar vascular prominence occurs in several clinical conditions, but in the collagen group it is most commonly seen in polyarteritis. Interstitial pulmonary fibrosis and emphysema are also seen in many clinical conditions, but in the collagen group they occur most commonly in scleroderma and dermatomyositis. A honeycomb appearance or peculiar multiple small cyst-like shadows in the lower two-thirds of the lungs is rather characteristic of scleroderma when the sign is present.

S. J. SHANE

Zinc Metabolism in Hepatic Dysfunction.

B. L. VALLEE *et al.*: *Ann. Int. Med.*, 50: 1077, 1959.

Marked abnormalities of zinc metabolism occur in patients suffering from postalcoholic cirrhosis. Zinc concentrations in serum and in the liver tissue of such persons are markedly lowered. Simultaneously, these patients excrete abnormally large quantities of zinc in their urine; one patient, in a terminal state, however, excreted abnormally low quantities of zinc. The administration of zinc sulfate in physiological quantities tends to restore normal excretory patterns. The bromsulfalein retention in five patients with post-alcoholic cirrhosis tended towards normal in the course of these investigations on zinc metabolism. No attempts at specific therapy of the disease were undertaken.

The data are interpreted in the light of the comparative biochemistry of zinc and ethanol metabolism. A conditioned zinc deficiency is conjectured to be consistent with the present data and the known historical, pathophysiological and pathobiochemical features of this disease.

S. J. SHANE

Pericardial Tamponade Following Percutaneous Left Ventricular Puncture.

R. J. BOTHAM, G. G. ROWE AND W. P. YOUNG: *Circulation*, 19: 741, 1959.

A pericardial tamponade developed in association with percutaneous left ventricular puncture for the assessment of aortic stenosis. Although such puncture has been performed by various investigators with the aid of local anæsthesia only, the use of general anæsthesia was certainly of considerable aid in the management of the complication of tamponade herein reported.

The authors urge strongly that percutaneous left ventricular puncture should be carried out by persons aware of and experienced in the management of the complications that may develop, and in an environment well equipped for the immediate and proper management of such complications.

S. J. SHANE

SURGERY

Asymptomatic Abdominal Masses in Infants and Children.

C. D. BENSON AND C. R. REINERS: *A.M.A. Arch. Surg.*, 78: 688, 1959.

Abdominal examination may detect a mass which has not caused symptoms and lead to the treatment of a lesion when the possibility of cure is feasible. Next to accidents, the greatest cause of death in children is benign and malignant tumours, most of which are of congenital origin. Neuroblastoma is the commonest and the results of treatment are unpredictable. Wilms's tumour or renal embryoma is the next. Unilateral multicystic kidney and congenital hydronephrosis may be successfully treated and should be differentiated from polycystic disease. Retroperitoneal teratoma can also be removed successfully but all untreated cases die. Hamartoma of the liver is extremely rare and should be treated by excision. Other lesions found in this series from Detroit included an iliac aneurysm which ruptured, duplication of the ileum, and papillary adenocarcinoma of the kidney.

If an asymptomatic mass can be detected in an infant or child, the prospect for survival and cure is encouraging.

BURNS PLEWES

Our Changing Cardiovascular Attitudes Towards Major Surgery.

E. I. MELICH: *A.M.A. Arch. Surg.*, 78: 340, 1959.

The cardiologist or internist is often called on by the surgeon to share the evaluation of cardiac fitness of a patient for an indicated operation. A cardiac lesion may be discovered by routine examination and this may be the first indication of its presence, or the patient may have cardiac disease, perhaps with failure which casts doubt on the wisdom of a surgical operation. The over-65 population has quadrupled since 1900 and the average age of patients undergoing surgery has increased greatly in recent years.

In a review of over 200 patients undergoing major surgery in a Veterans Hospital, the status with regard to surgery is reviewed in cases of hypertension, arrhythmias, ventricular tachycardia, fibrillation, conduction defects, coronary disease and cardiac decompensation. The evaluation of the operative and anæsthetic risk, preparation of the patient and the increasing danger of longer operating time are emphasized. The greater percentage of major surgery being done in the aged is accompanied by a mortality and prognosis commensurate with factors improving longevity. An extracardiac diseased organ may be the stress causing myocardial or coronary failure.

Postoperative shock or death does not indicate that the internist or practitioner has misjudged the heart as a major surgical risk, for there are still physiological extracardiac components beyond present knowledge and understanding causing peripheral collapse.

BURNS PLEWES

Treatment of Venous Ulcers of the Leg.

W. H. PRIOLEAN AND D. B. NUNN: *Ann. Surg.*, 149: 914, 1959.

In reporting a series of 110 cases of venous ulcers of the leg, the authors point out that the problems of both the postphlebitic and the varicose vein types return to the necessity of controlling the venostasis due to incompetent communicating veins. Operations to excise fibrotic tissue and ligate and excise veins are not successful till lymphœdema and ischæmia have been controlled by firm support from toes to knee, and for this a combination of Unna's paste and elastic adhesive bandage is advocated. After the ulcer has healed and dermatitis and œdema have been controlled, excision of the saphenous vein and ligation of incompetent communicating veins are performed. Often the operation is done in stages. Seldom is such extensive surgery done on both legs at one time. Injection of sclerosing agents has been discontinued since the occurrence of serious deep phlebitis. BURNS PLEWES

Congenital Tracheo-Œsophageal Fistula in an Adult.

C. C. FERGUSON AND C. B. SCHOEMPERLEN: *Ann. Surg.*, 149: 582, 1959.

Congenital tracheo-œsophageal fistula without œsophageal atresia is rare, and most of these cases are reported in infants. A case is reported from Winnipeg General Hospital of a woman, aged 23, whose fistula was closed successfully. The associated bronchiectasis improved after the operation and the associated congenital heart lesions were found to be no significant handicap. BURNS PLEWES

INDUSTRIAL MEDICINE

Chelating Agents in Treatment of Acute Porphyria.

J. T. GALAMBOS AND L. B. PEACOCK: *Ann. Int. Med.*, 50: 1056, 1959.

A patient who had had prolonged exposure to zinc and lead dust and who developed acute intermittent porphyria was treated with calcium disodium ethylenediamine tetra-acetate on three separate occasions. Each time his clinical course became worse, necessitating discontinuation of chelation therapy.

Because chelating agents can precipitate acute intermittent porphyria or make the existing disease worse, the authors caution against their indiscriminate use in acute intermittent porphyria. In the presence of increased body content of lead, a chelating agent such as calcium EDTA may have dramatic results on the clinical course of acute porphyria. Clinical usefulness and the mechanism of action of chelating agents in treatment of porphyria require further evaluation.

S. J. SHANE

Industrial Noise and Hearing Loss.

M. S. FOX AND A. GLORIG: *J. Chronic Dis.*, 9: 143, 1959.

With the rapid expansion of industrial development, the industrial noise problem is assuming increasing importance, particularly in relation to hearing loss. Recent decisions of the higher courts, upholding the right of the worker to claim compensation for hearing loss arising from industrial noise exposure, have been handed down in the states of New York and Wisconsin and by the Federal Courts of New York. These, together with the growing awareness of the effect of industrial noise upon hearing loss, have led to an active interest on the part of many industries and to a realization of the importance of hearing conservation. An understanding of this problem, with the co-operation of all those concerned, can lead to conservation of hearing in industry.

The problem involves many technical and professional fields. Discussion is presented with reference to effects of noise exposure, conservation of hearing, medical responsibility, and medico-legal aspects.

The known effects of noise exposure are of two types: non-auditory and auditory. The non-auditory may involve temporary physiological changes; the annoyance caused, however, is largely psychological. Auditory effects may be temporary or permanent. The hearing loss varies with (a) the type of exposure and its degree of intermittency, (b) the person who is exposed, (c) the total duration, and (d) the use of ear protection. Known information pertains only to continuous noises.

Well-organized and properly monitored programs of hearing conservation will prevent or greatly minimize noise-induced hearing loss. Such a program includes analysis of exposure, control of exposure, and measurement of hearing. The latter is the most important. Direct medical supervision is recommended, the physician being responsible for the organization and administration of the testing program as well as for checking and evaluating audiometric records. Co-operation with members of the medical, engineering and safety departments is essential.

MARGARET H. WILTON

Canad. M. A. J.
Jan. 30, 1960, vol. 82

Canadian Medical Retirement Savings Plan

ONE PLAN — TWO METHODS OF SAVING

C.M.R.S.P. is a savings arrangement, established by The Canadian Medical Association and registered with the Government, providing facilities for the purchase of retirement annuities on a group basis by tax exempt contributions.

Since the adequacy of your retirement income depends both on the amount you are willing to save and the purchasing power of the dollar, two methods of saving are made available:

1. An insured annuity plan, underwritten by The National Life Assurance Company of Canada, incorporating long-term guarantees in addition to participation in the profits of the insurer.

2. A common stock investment plan, managed by The Royal Trust Company, which translates your contributions into common shares in leading companies allowing you to participate in the growth of the Canadian economy.

JOIN NOW

If you have not previously applied, it is necessary that you forward a completed application card (see opposite page) to the C.M.A. office prior to February 9, 1960, in order that we may register your contract for 1959 tax relief.

TAX SAVINGS

The table below shows the federal income tax savings which would accrue to a participant contributing the maximum amount permitted by legislation — 10% of net earned income or $2500 whichever is the lesser (assuming $2500 personal deductions). In addition, Quebec residents may now claim such contributions as exemptions for provincial income tax purposes.

Earned Income	*Tax Applicable*	*Tax Exempt Retirement Savings Allowance*	*Tax Payable*	*Tax Savings*
$ 8,000	$ 1,030	$ 800	$ 854	$ 176
10,000	1,530	1,000	1,270	260
12,500	2,260	1,250	1,885	375
15,000	3,160	1,500	2,610	550
20,000	5,285	2,000	4,385	900
25,000	7,535	2,500	6,410	1,125
35,000	12,410	2,500	11,160	1,250

MAXIMUM FLEXIBILITY

Contributions may vary from year to year but may not be less than $300 per year or more than the maximum permitted by legislation. Complete flexibility is provided within these limits and each member may direct his contributions to each element of the Plan in any desired proportion.
(Maintenance of insured annuity plan guarantees requires a $100 per year minimum contribution to this plan.)

OUR PERFORMANCE

The response of our members has been most encouraging. In the first contribution year (September 1, 1957—February 28, 1958) almost 1800 doctors applied for registration. Now, after two years' operation, we have 2175 participants who have invested more than $5,350,000.

INVESTMENT RESULTS

The following tables show the investment results to date. While similar results cannot be guaranteed for the future, they indicate the care and attention which these investments receive.

INSURED ANNUITY PLAN

Contract Year Ending	*Guaranteed Interest Rate*	*Dividend*	*Total Rate Credited*
February 28, 1958	3½%	¾%	4¼%
February 28, 1959	3½%	1%	4½%
February 29, 1960	3½%	1%	4½%

COMMON STOCK PLAN

Date	*Unit Value*
December, 1957	$10.00
June 1, 1958	10.40
December 1, 1958	11.82
June 1, 1959	13.02
September 1, 1959	13.00
December 1, 1959	12.58

WITHDRAWAL BENEFITS

The purpose of C.M.R.S.P. is the encouragement of savings to provide retirement income in accordance with legislation. The contracts and agreements negotiated in connection with the Plan only provide for payment in the form of death or annuity benefits. However, in cases where members of the C.M.R.S.P. have applied to have their contracts amended so that they can withdraw contributions, liberal withdrawal benefits have been paid, subject to applicable tax (minimum 25%).

JOIN NOW — YOU CAN'T MAKE A BETTER INVESTMENT

The flexibility and economies associated with group purchasing power inherent in C.M.R.S.P. have not been seriously challenged by any competing proposal, whether insured or trusteed. Join now by completing the application card on the opposite page or, if you require more information, write to The Canadian Medical Association, 150 St. George Street, Toronto, Ontario.

DETACH AT PERFORATION AND MAIL COMPLETED APPLICATION TO C.M.A. HOUSE, 150 ST. GEORGE ST., TORONTO

DETACH AT PERFORATION AND MAIL COMPLETED APPLICATION TO C.M.A. HOUSE, 150 ST. GEORGE ST., TORONTO.

Application for Participation in

THE CANADIAN MEDICAL RETIREMENT SAVINGS PLAN

I hereby apply for participation in the Canadian Medical Retirement Savings Plan, the provisions of which are familiar to me. I understand that such participation entitles me to membership in certain Retirement Savings Plans, arranged with The National Life Assurance Company of Canada and The Royal Trust Company, and my application for such membership is indicated by my request that contributions be allocated to such Plan or Plans. I request that the instruments evidencing the terms of such membership be registered as Retirement Savings Plans under the Income Tax Act (Canada). I understand that as a consequence of such registration payments out of the Plans can only be made in the form of a life-contingency annuity or as a death benefit and that such payments to me or to my beneficiaries, executors or legal representatives will be subject to tax under the provisions of the Income Tax Act of Canada.

I understand that I am required to make payments into C.M.R.S.P. on a regular basis of at least $300 yearly, and I request that _____ per cent of these future payments be apportioned to my account in the Insured Annuity Retirement Savings Plan, underwritten by The National Life Assurance Company of Canada, and that the remainder of such future payments be apportioned to the Common Stock Retirement Savings Plan, managed by The Royal Trust Company, and be commingled therein with the payments made by other members. I understand that this percentage allocation may subsequently be varied by written notice in accordance with the provisions of C.M.R.S.P.

I undertake, upon request, to provide proof of age satisfactory to the issuer of any annuity contracts provided to me as a benefit under these Plans.

I hereby appoint The Canadian Medical Association to act as my Agent in the negotiation of contracts and agreements to carry out the provisions of C.M.R.S.P. and through the Association, I grant discretionary investment power to the managers of the Common Stock Retirement Savings Plan.

DATE..... SIGNATURE.....

WITNESS.....

Read and complete details listed below and return to—

THE CANADIAN MEDICAL ASSOCIATION - - - 150 St. George St., Toronto, Ont.

PLEASE PRINT OR TYPE REQUIRED INFORMATION

NAME.....
SURNAME COMPLETE CHRISTIAN NAMES

ADDRESS.....
STREET AND NO. CITY OR TOWN PROVINCE

DATE OF BIRTH..... SEX.....
DAY MONTH YEAR

CONTRIBUTIONS— ☐ Regular payments through your local branch of the Bank of Montreal.....
BRANCH CITY OR TOWN

Check (√) method of payment ☐ Payment to the Bank of Montreal of certain regular amounts to be charged to your account in a branch of another bank.

.....
NAME OF YOUR BANK BRANCH CITY OR TOWN

Each contribution year ends on the ninth day of the month of February. All contributions made during each yearly period—February 10th to February 9th—are classified for tax purposes as contributions made during the calendar year which ends during this specific period. Thus, contributions made prior to the ninth day of February, 1960 are considered to be 1959 contributions. In order to so qualify, your contributions must be deposited in a branch of the Bank of Montreal on or prior to February 9th, 1960.

Each contribution will be acknowledged by the Bank of Montreal by an entry in a special pass-book. Each year you will receive a statement of accumulated contributions and a certificate for income tax purposes.

DEATH BENEFITS—

Benefits payable after your death will be paid to your executors or legal representatives. You may, however, indicate below the name of a beneficiary to receive that portion of any such benefits which arises out of your participation in the Insured Annuity Retirement Savings Plan.

BENEFICIARY'S NAME.....
SURNAME CHRISTIAN NAMES

ADDRESS.....
STREET AND NO. CITY OR TOWN PROVINCE

RELATIONSHIP TO YOU.....

DATE..... YOUR SIGNATURE.....

WITNESS.....

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BOOK REVIEWS

A WAY OF LIFE AND OTHER SELECTED WRITINGS OF SIR WILLIAM OSLER. 278 pp. Illust. Dover Publications Inc., New York, 1959. $1.65.

A recent review of some of Osler's writings in a medical school magazine suggested that the master would no longer appeal to the modern medical student. It is hard for an older person to know just what would appeal to medical students of this age, but it is even harder to believe that the writings of Osler have in any way lost their charm, or for that matter their general applicability. The present volume is an issue in paperback of a book first published by the Oxford University Press in 1951 under the title "Selected Writings of Sir William Osler" and got together as a centenary tribute to their patron saint by a committee of the Osler Club of London, with the help of the late Dr. William Francis of Montreal. The committee chose wisely and they chose with the medical student in mind. Side by side with Osler's contributions to the history of medicine as exemplified by essays on Sir Thomas Browne, Robert Burton, Servetus, Beaumont and others, are his essays written particularly for students such as "Letters to my House Physicians", "The Student Life" and "A Way of Life". He also writes about libraries and about the relationship between the humanities and science. In this last essay, given to the Classical Association in 1919, he gives his views on war which are just as valid 40 years later. Reading some of these essays once more, the reviewer finds it difficult to believe that the more intelligent student or young physician will not find enjoyment and instruction therein.

THE HAND: ITS ANATOMY AND DISEASES. John J. Byrne, Boston University School of Medicine. 384 pp. Illust. Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1959. $11.50.

In this excellent monograph, the author gives concise but very thorough coverage to all facets and considerations in surgery of the hand. A good review of salient anatomical features as well as embryology is presented in a very readable form. Here, as elsewhere throughout the book, many illustrations are to be found.

After setting down the general principles in treatment of hand infections the various bacteriological factors are considered. This section in particular presents material which is also useful in the understanding of infections elsewhere. The chapter on anatomical localization outlines the areas where suppuration can be expected to collect and the incisions to be used.

Part III deals with general principles of trauma to the hand, with a detailed study of injuries to the skin, tendons, nerves, bones and joints. The reader is reminded of the extreme importance of proper handling of these cases and of the tremendous financial burden produced by often lengthy or permanent disability.

In Chapter 8, a good review of the histology and methods of tendon healing is presented. This author also cautions that the commonest mistake of the beginner in this field is to waste time trying to operate through an inadequate incision. Preference is given to the Bunnell zigzag suture, and the method is described. Just what should be done in the various regions of the hand is also of vital importance to the ultimate prognosis. In a similar way, the various considerations in nerve injuries are outlined.

What may appear as a rather trivial bone or joint injury is often poorly treated, with resultant substandard functional results. Any doctor dealing with such injuries is bound to pick up some useful tips by perusing this section.

Special injuries such as thermal and radiation burns are briefly referred to, as well as other relatively less common curiosities such as beryllium granulomas and grease gun, aerosol bomb and porcelain faucet injuries. The bibliography on which these are based is detailed and would make a good source of references.

The reader will undoubtedly find the chapter dealing with fibrous hyperplasia interesting reading; it also provides the latest concepts in pathology and treatment of Dupuytren's contracture and stenosing tenosynovitis. The many tumour conditions which can affect the bony and soft tissues of the hand are given an excellent description with beautiful illustrations. This section contains numerous fascinating terms and definitions such as paraxial hemimelia, acheiria, pseudoainhum, symphalangism, hyperphalangism and streblomicrodactyly.

The various manifestations of the different vascular diseases and ischæmic muscular contraction are discussed, as well as the latest concepts in treatment. Useful tips in plastic and reconstructive surgery of scars and various deformities are to be found in the closing pages, so that all in all the book deserves wide usage.

CURRENT PROBLEMS IN ALLERGY AND IMMUNOLOGY. Dedicated to Dr. Béla Schick and edited by William Kaufman, Bridgeport, Conn. 988 pp. Illust. S. Karger, Basel and New York, 1959. $14.40.

This volume, dedicated to Béla Schick on the occasion of his 80th birthday, is a tribute to a man who has created affection in the hearts of many. It is also a tribute to a doctor who has made great contributions to medicine itself, and who has inspired others.

There are a preface and three introductory articles by men who have known him well and who give their reasons for revering him. Sixty-three scientific articles are evidence that others have affection for him as well. The articles have all appeared before in the *International Archives of Allergy* and *Applied Immunology*, for they were published as they were received. When completed they were assembled in this volume. The author index might well be a "Who's Who in Allergy and Immunology", including Selye, Gottleib, Kaugman, Peskan, Criep, Sulzberger, and Prausnitz, to mention a few.

The subjects of the articles vary as much as those in a medical journal. The clarity varies in the same way. Some are written by masters at teaching, others by authors who are less experienced and so less intelligible. Some of the articles are reviews of major divisions of the field of allergy, others are reports of research work of limited scope and interest. The subjects of some articles overlap others. Some give conflicting views.

One can readily see that this volume is for the person with an interest in Béla Schick and out of the beginning stage of learning in this field. It has advantages over an up-to-date medical journal in that most of the articles are by leading men, but it would be misleading to anyone who expected a textbook. It might well be useful in the library of an allergist or immunologist, or in any general medical library.

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THE MAST CELLS. James F. Riley, Consultant Radiotherapist, Royal Infirmary, Dundee. 182 pp. Illust. E. & S. Livingstone Ltd., Edinburgh and London; The Macmillan Company of Canada Limited, Toronto, 1959. $5.00.

This very readable monograph is an up-to-date account of the extensive investigations which have been made of the ubiquitous and mysterious mast cells of connective tissue. The first part is a penetrating review of the literature. The second part is a detailed and objective account of the author's own investigations, with convincing evidence that mast cells are related to tissue histamine. An outstanding feature of the book is its extensive bibliography.

The text is much broader in scope than the title implies and contains discussions not only of the possible functions of mast cells and of the possible role of histamine in inflammation but also of heparin, hyaluronic acid, enzymes, histamine-liberators and other biologically active agents.

That this monograph is not the final word on mast cells the author recognizes, and in the last chapter he states: "Eighty years have now passed since Ehrlich first clearly described and named the tissue mast cells, and we are still far from understanding their biological significance in the organism." This booklet, therefore, is not only a record of extensive investigations and brilliant analyses but also a challenge and stimulus for further investigations.

Cytologists, histologists, and experimental pathologists, as well as physiologists and biochemists, will find the book a valuable reference. It should be required reading for anyone who begins an investigation involving mast cells.

NIERENKRANKHEITEN (RENAL DISEASES). Hans Sarre, Professor of Internal Medicine, Medical Polyclinic of the University of Freiburg. 555 pp. Illust. 2nd ed. Georg Thieme Verlag, Stuttgart, West Germany; Intercontinental Medical Book Corporation, New York, 1959. $14.05.

This second edition is the most complete existing monograph on renal diseases, and includes an account of all the progress, new methods and research on this important subject from 1950 to date, with a fairly complete index of literature.

Physiology and physiotherapy are viewed in the light of fundamentals for the understanding of diagnosis and therapy. The chapter on physiology deals with such subjects as: determination of glomerular filtrate composition, clearance methods, biochemistry of tubular function, mineral and water exchanges, hormonal factors and their influence on the above.

In the sections on physiopathology, the intrarenal process of urine concentration, the pathogenesis of nephrosis, and other subjects are considered.

In the chemical section the chief syndromes of acute and chronic renal insufficiency, the nephrotic syndrome and renal hypertension, bilateral "hæmatogenous" renal diseases and many unilateral conditions such as pyelonephritis, renal tuberculosis, and bilateral nephrolithiasis, idiopathic hypercalcæmia, the oxaloses, glycinuria and xanthinuria are discussed.

The section on therapy of renal diseases deals with diet, drugs and dialysis in the light of present knowledge. Tables of normal values and of diets and differential diagnostic classifications complete this work, while 134 illustrations and diagrams contribute to a better understanding of the contents.

GENETICS, RADIOBIOLOGY AND RADIOLOGY. PROCEEDINGS, MID-WESTERN CONFERENCE. Wendell G. Scott and Titus Evans. 149 pp. Illust. Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1959. $6.00.

A conference was held on May 2, 1958, sponsored by the U.S. Academy of Sciences—National Research Council, to bring together geneticists, radiobiologists and radiologists for a discussion of the possible deleterious effects arising from the medical and dental use of x-rays. The proceedings, which now appear in book form, are divided into two parts, the first part being concerned with the fundamentals of radiation genetics and the second with the problem of reducing radiation genetic effects in the medical use of x-rays.

The reviewer found the papers in the first part by Dr. J. F. Crow, and in the second part by Dr. D. Gould, particularly interesting. In assessing the impact on future generations of an increased mutation rate due to radiation, Dr. Crow emphasizes the lack of quantitative human data. On the basis of the figures available, he estimates that if the (U.S.) population as a whole continues to receive the same amount of radiation as is now given through the use of radiation in medical diagnosis and treatment, then an additional 0.2% of children born will have a serious genetic impairment. This risk must be balanced against the good that comes from the medical use of radiation.

Dr. Gould describes a number of radiological techniques which may be used to reduce the radiation dose received by the patient during an x-ray examination. He emphasizes that the routine use of roentgenological procedures should be avoided. He believes that by following the rules he outlines, a trained radiologist can reduce the radiation hazard by 50%.

The book contains few surprises for the specialist in radiobiology, but it should be of value to those with a general interest in this important topic.

MEDIZINISCHE GRUNDLAGENFORSCHUNG (Basic Research in Medicine, Vol. II). Edited by K. Fr. Bauer, Erlangen, Germany. 827 pp. Illust. Georg Thieme Verlag, Stuttgart, W. Germany. Intercontinental Medical Book Corporation, New York, N.Y., 1959. $40.00.

This is the second volume in a series devoted to the problems of contemporary basic research in medicine. It comprises seventeen contributions by prominent men of science and deals with subjects pertaining to neurophysiology, pathological anatomy, histology, therapeutics, cell physiology, and biochemistry. In addition, it contains a most stimulating article by Professor R. Haase on "Structure formation in nature and the second law of thermodynamics". Each article is written by an authority who has contributed a great deal of original research to the field under discussion, and the editor, Professor K. Fr. Bauer of Erlangen, should be congratulated for his excellent choice of both the subjects and the contributors.

In view of the extremely varied subject matter covered by this volume, it is impossible to summarize it in the form of a book review, but anyone interested in the principal problems of modern basic research in medicine will find here competent and easy to read outlines of those research subjects that now occupy central positions in medical investigation. The volume is provided with an extensive bibliography and a carefully prepared subject index.

THE CARE OF MINOR HAND INJURIES. Adrian E. Flatt, State University of Iowa, Iowa City. 266 pp. Illust. The C. V. Mosby Co., St. Louis, Mo., 1959. $9.50.

This excellent monograph opens with a lucid chapter on the relevant anatomy. The remainder of the first section discusses the principles of care and techniques, and closes with a classification of hand injuries.

The author then goes on to discuss specific injuries which can and should be treated in the outpatient department. These are thoroughly and clearly described and, in the main, the advice could not be improved upon. The reviewer does not believe that the thenar flap is a good flap, but cannot find any fault with the remainder of the section.

The volume closes with a short discussion of burns of the hand and of infections of the hand.

This well-illustrated book can be thoroughly recommended and will prove of value to the senior student, to the occasional operator, and to the specialist.

NUTRITION FOR TODAY. Elizabeth Chant Robertson, Research Institute, Hospital for Sick Children, Toronto. 259 pp. Illust. 2nd ed. McClelland & Stewart Limited, Toronto, 1959. $2.95.

"Nutrition for Today" is of value to the physician because of the practical way in which foods and family meals have been related to the nutritional needs of all age groups. It is, in addition, a book to be recommended to patients interested in a source of authoritative information on nutrition. The second revised edition brings up-to-date the table of "Recommended Daily Dietary Allowances" of the Food and Nutrition Board of the National Research Council in the United States and incorporates references to new food products which have appeared on the market since the previous edition was published.

BAUPRINZIPIEN DES SAUGERSKELETES (Structural Principles of the Mammalian Skeleton). Benno Kummer, Frankfurt-am-Main University, Germany. 235 pp. Illust. Georg Thieme Verlag, Stuttgart, West Germany; Intercontinental Medical Book Corporation, New York, 1959. $10.70.

The work under review is dedicated to Prof. Pauwels, an orthopædic surgeon, who in the course of many years of practical as well as theoretical studies has put forward many novel ideas about the mechanics of the living human locomotor apparatus. Pauwels' work has not only enriched orthopædics but has also given a new direction to studies of "functional anatomy" and has disposed of many ideas of the relationship between form and function which had been widely held since Roux and Benninghoff. It was Pauwels, for example, who discovered the "traction belt" effect of certain muscles on tubular bones, and also the idea that the uneven growth in length of long bones and resultant curvature of the shaft is the bone's response to unequal pressure on the epiphyseal cartilage.

Dr. Kummer has applied Pauwels' ideas to the field of comparative anatomy. He describes the structural principles of many different types of mammalian locomotor apparatus and discusses basic ideas and methods of biomechanics. Particularly valuable is a chapter on the theory and application of optical methods for the detection of stresses; a subject which has lately been improved and simplified by Dr. Kummer's own contributions.

The book is divided into three main sections: (1) the statics of the body as a whole, especially of the trunk and spine; (2) the statics of the limbs and the functional shape of tubular bones, with hind legs and femur providing the chief examples; and (3) the functional organization of the spongiosa and methods for its exploration. This section consists mainly of a description of the proximal end of the femur. This is an outstanding work, well produced and beautifully illustrated. Anyone interested in the problems indicated by the terms "functional system", "functional adaptation" and "functional structure" will gain from reading it.

HISTORY AND TRENDS OF PROFESSIONAL NURSING. Deborah MacLurg Jensen, Associate Director, School of Nursing, St. Louis City Hospital, St. Louis, Mo. 610 pp. 4th ed. The C. V. Mosby Co., St. Louis, Mo., 1959. $5.25.

The presentation of the history of nursing and trends in professional nursing together places these two subjects in their logical relationship, enabling the student to gain a better appreciation of the need for history as well as a better understanding of the reasons for present trends.

This book is well written and would be a helpful reference but its use is limited because it describes the development of nursing as it applies to the United States. This again points out the need for a Canadian text on this subject.

The suggested projects at the end of each unit are excellent.

POISONOUS AMPHIBIANS AND REPTILES. Floyd Boys, Associate Professor of Health Education, and Hobart M. Smith, Professor of Zoology, University of Illinois. 149 pp. Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1959. $5.25.

This little book is to be highly recommended for both medical and public libraries in regions where snakebite is likely to occur. The authors, a physician and a herpetologist of long experience, have examined and assessed a rather scattered literature, consulted with top-ranking specialists, and selectively pooled from their fields of knowledge to produce a very helpful and easily readable book, designed to guide both the physician and the layman in the recognition and treatment of reptile and amphibian envenomation.

The book is of pleasing format, well printed on good paper. It is divided into nine parts; the table of contents at the front lists the main headings and subheadings, with page numbers. There is an alphabetical index, a bibliography of 73 items, and a postscript (p. 143) which should be read.

The treatment of the subject is broad, and includes brief accounts of the classification, structure and natural history of the animals concerned, pertinent to the main purpose of the book.

Part II (five pages) deals with poisonous amphibia, a group of relatively little concern in North America, where, aside from warty toads and two species of red-legged frogs, no others are believed to have dangerously strong skin poisons. Part III (three pages) discusses poisonous turtles, none of which is actually venomous. The flesh of the eastern box turtle, the authors warn, may become poisonous by reason of the animal's eating poisonous fungi, and that of some sea turtles presumably from eating poisonous algæ. Treatment must be directed to the plant poison involved. Part IV (six pages) deals with the beaded lizard and Gila monster of the southwestern United

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States and Mexico. First aid and medical treatment for their highly dangerous bites are discussed, but there is no antivenin. From there on (parts V to IX) the book deals with venomous snakes and their bites.

There is considerable information on the recognition of venomous snake bites, kinds of venoms, rate and means of venom spread, symptoms local and systemic resulting from hæmopathic and neurotoxic fractions, a number of which are listed with the nature of their physiological actions.

First-aid measures in snakebite are so clearly set out that any untrained person of ordinary intelligence could follow them. The reviewer was glad to see the value of the tourniquet, incision (the authors advise against X-shaped cuts) and suction emphasized again, in view of recent nefarious attempts to discredit their well-proven effectiveness on the basis of manifestly faulty experiments and biased conclusions.

In the section on medical treatment (part IX) the importance of immediate blood typing is stressed, since venom action may shortly render this impossible. A urinalysis and complete blood count should be done, the authors advise (quoting from Shannon), but omit to mention that these procedures should be repeated at least daily. The danger from shock is emphasized and anti-shock measures, including blood transfusion and other intravenous therapy, are discussed. The facts regarding antivenin are candidly presented with reference to its proven value, its limitations, and its dangers.

A number of special drugs which have been or are being tried in snakebite therapy are discussed with reference to their clinical significance as understood to date. Cortisone and ACTH do not appear to rate as highly as might have been hoped; neither do antihistamines in the treatment of North American snakebites. Certain calcium supplements, calcium gluconate and calcium lactate, appear to be promising. The authors report that in Pueblo, Mexico, where much of the population is sensitive to horse serum, intravenous injection of 10% calcium gluconate is the standard and basically sole treatment of snakebite in at least one large hospital. The facts were obtained from Dr. Wm. E. Duellman, who was himself hospitalized there for snakebite.

The danger of neurotoxic elements in viper venoms asserting themselves after the hæmorrhagic symptoms have been alleviated is plainly stated, as is the need for continued watchfulness for the first 72 hours, and occasionally for even two weeks. Methods of treating neurotoxic involvement are discussed.

Cryotherapy, loudly advocated by some modern writers, both medical and popular, is rejected by the authors, there being sufficient evidence to condemn it as predisposing to tissue death and gangrene when applied to snakebite.

On page 20, line 7, there was evidently an error in copying, for the text as it stands implies that tetanus and gas gangrene are the same thing, which would not have been the intention of the authors.

It is a pleasure to recommend this excellent little volume, the contents of which should be known to physicians who may be called upon to treat a case of snakebite, and that of the first-aid section to laymen who live or holiday in rattlesnake country. Most readers, however, who start this book, will probably read it all for pleasure.

FORTHCOMING MEETINGS

CANADA

COLLEGE OF GENERAL PRACTICE OF CANADA, Fourth Annual Scientific Assembly, Montreal, Que. (Dr. W. V. Johnston, Executive Director, 176 St. George Street, Toronto 5, Ont.) February 29-March 3, 1960.

SECTION OF GENERAL PRACTICE, B.C. DIVISION, CANADIAN MEDICAL ASSOCIATION, Eighth Annual Scientific Session, Harrison Hot Springs Hotel, Harrison, B.C. (In charge of registration: Dr. R. A. White, Oliver, B.C.) March 30-April 2, 1960.

ONTARIO CHAPTER, COLLEGE OF GENERAL PRACTICE OF CANADA, Annual Clinic Day, Kitchener, Ont. (Dr. N. R. McMurchy, Publicity Chairman, 215 Frederick St., Kitchener, Ont.) April 6, 1959.

CANADIAN ANÆSTHETISTS' SOCIETY, Western Divisional Meeting, Victoria, B.C. (Dr. W. L. Esdale, Secretary-Treasurer, B.C. Division, Canadian Anæsthetists' Society, 7476 Inverness St., Vancouver.) April 28-30, 1960.

ONTARIO MEDICAL ASSOCIATION, 80th Annual Meeting, Toronto, Ont. (Dr. Glenn Sawyer, General Secretary, 244 St. George Street, Toronto 5, Ont.) May 9-13, 1960.

CANADIAN PUBLIC HEALTH ASSOCIATION, 48th Annual Meeting, Halifax, N.S. (Dr. G. W. O. Moss, Honorary Secretary, 150 College Street, Toronto 5, Ont.) May 31-June 2, 1960.

CANADIAN FEDERATION OF BIOLOGICAL SOCIETIES (comprising the Canadian Physiological Society, the Pharmacological Society of Canada, the Canadian Association of Anatomists and the Canadian Biochemical Society), Third Annual Meeting, Winnipeg, Man. (Dr. E. H. Bensley, Honorary Secretary, Montreal General Hospital, 1650 Cedar Ave., Montreal 25, Que.) June 8-10, 1960.

CANADIAN OTOLARYNGOLOGICAL SOCIETY (SOCIÉTÉ CANADIENNE D'OTOLARYNGOLOGIE), Annual Meeting, Jasper Park Lodge, Jasper National Park, Alberta. (Dr. Donald M. MacRae, Secretary, 324 Spring Garden Road, Halifax, N.S.) June 10-12, 1960.

CANADIAN MEDICAL ASSOCIATION, 93rd Annual Meeting, Banff, Alberta. (Dr. A. D. Kelly, General Secretary, C.M.A. House, 150 St. George Street, Toronto 5, Ont.) June 13-17, 1960.

2ND WORLD CONGRESS OF THE WORLD FEDERATION OF SOCIETIES OF ANÆSTHESIOLOGISTS, Toronto, Ont. (Dr. R. A. Gordon, Chairman of Organizing Committee, 178 St. George Street, Toronto 5, Ont.) September 4-10, 1960.

UNITED STATES

AMERICAN COLLEGE OF ALLERGISTS, Sixteenth Congress and Graduate Instructional Course in Allergy, American Hotel, Bal Harbor, Miami Beach, Florida. (American College of Allergists, 2049 Broadway, Boulder, Colorado, U.S.A.) February 28-March 4, 1960.

7TH INTERNATIONAL ANATOMICAL CONGRESS, New York. (Dr. D. W. Fawcett, Executive Secretary, Department of Anatomy, Cornell University Medical College, 1300 York Ave., New York 21, N.Y.) April 11-16, 1960.

SOCIETY OF AMERICAN BACTERIOLOGISTS, 60th Annual Meeting, Philadelphia, Pa. May 1-5, 1960.

NATIONAL TUBERCULOSIS ASSOCIATION, Annual Meeting, in conjunction with the American Trudeau Society, Los Angeles, Calif. (Sol S. Lifson, Director, Education and Public Relations, National Tuberculosis Association, 1790 Broadway, New York 19, N.Y.) May 16-18, 1960.

OTHER COUNTRIES

FIRST BAHAMAS ALLERGY CONFERENCE, Nassau Beach Lodge, Nassau Bahamas. (Dr. B. L. Frank, Organizing Physician, Bahamas Conferences, P.O. Box 4037, Fort Lauderdale, Florida.) March 5-12, 1960.

GENERAL SURGEON required for July 1, 1960 in a group forming in a rapidly expanding northern mining community. Preference to someone who is also familiar with orthopædic techniques. This is a permanent position in a new area with an assured future. Proposed arrangement is for salary remuneration initially with partnership available after eighteen months. This appointment will pay one thousand dollars ($1000) per month initially plus semi-annual increments of seventy-five dollars ($75) a month until partnership effective. A car allowance of fifty dollars ($50) a month will be provided. Fully modern hospital to be opened this summer coming. Family accommodation available in modern rental units. Complete school facilities are in operation. Apply giving particulars of training and experience to Box 584, CMA Journal, 150 St. George St., Toronto 5, Ont.

ASSISTANT NEEDED for expanding general practice in eastern Ontario town of 10,000, with partnership possible in one year. Two open hospitals, each of 100 beds. Interest in general practice necessary. Capability in general anæsthesia desired. If insufficient training in anæsthesia, further three months' postgraduate training paid for. Salary in excess of $700 monthly. Reply to Box 575, CMA Journal, 150 St. George St., Toronto 5, Ont.

GENERAL SURGEON, qualified or eligible, required for association with group consisting of internist, obstetrician and gynæcologist, and generalist, in growing town of 4000 and surrounding area of 6000. This town has modern clinic office facilities, and modern 45-bed hospital. There is an excellent opportunity for permanent arrangement if mutually agreeable. Reply to Wainwright Clinic, Wainwright, Alberta.

PSYCHIATRISTS AND PHYSICIANS.— Western State Hospital has a progressive treatment programme for the mentally ill. To continue our programme, we need the services of: chief of medical staff, psychiatrists, staff physicians. Western State Hospital is located at Hopkinsville, Kentucky—close to excellent hunting, fishing, and recreation areas, as well as six colleges and universities within 100 miles. Staff positions in other Kentucky state hospitals are also open. Requirements: CHIEF OF MEDICAL STAFF AND PSYCHIATRISTS — approved psychiatric training, plus three years' experience (D.Psy. preferred). Salary from $10,344. STAFF PHYSICIANS—Medical degrees and two years' experience including one year mental hospital training or experience. Salary—from $8940. Excellent retirement and leave benefits. Starting salary depends on experience and training. Send resume of training and experience to: Dr. Harold Conran, Superintendent, Western State Hospital, Hopkinsville, Kentucky, U.S.A.

TOWN OF LUSELAND, SASKATCHEWAN, WESTERN CANADA, requires medical doctor for new clinic and residence just completed in modern town serving a large area with heavy population, 140 miles west of Saskatoon, in one of the best districts in the province. Attractive offer to enable doctor to become established. Contact: Mr. S. C. Onerheim, Luseland, Saskatchewan, Canada.

SASKATCHEWAN GROUP PRACTICE has vacancy for young married graduate. City of 16,000. Starting salary $700 net monthly. One-fifth share in one year. Worth $1500 net monthly. Experience in Canadian practice essential. Reply to Box 595, CMA Journal, 150 St. George St., Toronto 5, Ont.

GENERAL SURGERY LOCUMS WANTED in western Ontario during July and August. Must be willing and able to do general work. Salary $1100 a month. Must have car. Housing, gas and oil provided. Extra $100 for travelling expenses. Reply to Box 596, CMA Journal, 150 St. George St., Toronto 5, Ont.

WANTED.—Physician for July, 1960 with special training or interest in obstetrics for general practice in southern Ontario lakeside town of 3000. Good hospital serves area of 10,000. New office building. Assistantship with early partnership if mutually satisfactory. Reply with full particulars including salary expected to Box 597, CMA Journal, 150 St. George St., Toronto 5, Ont.

WANTED.—Doctor with surgical experience to combine part time work in industrial clinic with private practice in surrounding community. Good housing and office space available. Knowledge of spoken French advantageous. Reply to Box 598, CMA Journal, 150 St. George St., Toronto 5, Ont.

PUBLIC HEALTH PHYSICIAN in New Mexico Department of Public Health. Salary range $9000 to $12,600. Fringe benefits. Excellent opportunity for young man. Write: Merit System Supervisor, 122 Capitol Place, Santa Fe, New Mexico.

UNIVERSITY HOSPITAL AT SASKATOON, SASK. now has a vacancy for an assistant bacteriologist. This appointment also carries a university teaching position. Salary $8000-$10,000 per annum. Applicants should have hospital and teaching experience. Applications stating date of birth, qualifications, experience, present appointment, and the names of three referees should be sent to the Dirctor of Bacteriology, University Hospital, Saskatoon, Sask. by April 15, 1960.

ENGLISH-SPEAKING GRADUATE of approved school for available staff physician position in a modern 215-bed accredited hospital for treatment of pulmonary diseases, predominately tuberculosis. Salary for one with a year's experience in pulmonary diseases, $7500, annual increments. Furnished apartment, utilities and laundry furnished. Contact E. Willis Hainlen, M.D., Director, Medical Services, Emily Bissell Hospital, 3000 Newport Gap Pike, Wilmington 8, Delaware.

WANTED.—An assistant for a busy partnership practice located about 100 miles north of Toronto. Completely modern office building and a good hospital. An opportunity for a compatible, competent man to work into a permanent arrangement. Duties to commence July 1, 1960. Please reply stating age, religion, and qualifications, submitting the names of two references to Box 599, CMA Journal, 150 St. George St., Toronto 5, Ont.

SOUTHERN CALIFORNIA GROUP OF 16 SPECIALISTS WISHES TO ADD THE FOLLOWING CERTIFIED OR ELIGIBLE MEN: ORTHOPÆDIC SURGEON, E.N.T. MAN, AND INTERNIST. THESE POSITIONS WOULD LEAD TO SUBSEQUENT PARTNERSHIP STATUS. WRITE ADMINISTRATOR, BOX 126, DOWNEY, CALIFORNIA.

LOCUM FOR GENERAL PRACTICE in rural Nova Scotia for the months March, April and May. Salary, $700 plus house etc. Reply to Box 600, CMA Journal, 150 St. George St., Toronto 5, Ont.

OBSTETRICIAN AND GYNÆCOLOGIST practising in Toronto requires associate. Reply stating full particulars to Box 601, CMA Journal, 150 St. George St., Toronto 5, Ont.

Practices

HOUSE AND PRACTICE FOR SALE in a central Ontario town. Records, office equipment and introductions included. Owner wishing to specialize. Reply to Box 510, CMA Journal, 150 St. George St., Toronto 5, Ont.

FOR SALE.—Suburban general practice, Vancouver, B.C. Close to modern open hospital. Annual gross over $23,000. Price: $4000 with easy terms, includes introduction, all equipment, furniture and records. Reply to Box 585, CMA Journal, 150 St. St. George St., Toronto 5, Ont.

GENERAL PRACTICE metropolitan Toronto suitable for 1 or 2 practitioners. Modern rented office, excellent location and equipment. For details reply to Box 586, CMA Journal, 150 St. George St. Toronto 5, Ont.

CERTIFIED OPHTHALMOLOGIST, F.R.C.S.(Eng.), F.R.C.S.(Edin.), D.O.M.S.(Lon.), wishes to dispose of his home surrounded by seven acres overlooking a beautiful bay, together with his country practice of eight years, on Vancouver Island, B.C. Price $20,000. Details in application to Box 587, CMA Journal, 150 St. George St., Toronto 5, Ont.

PORT-OF-SPAIN, TRINIDAD, Capital City of the Federated British West Indies. Population including surrounding area 200,000. Large practice together with a residence and office in a modern building recently built. Office accommodation includes large waiting room, 40 seating capacity, consulting room, physio-therapy room, minor surgery room, toilet facilities. Upstairs: Residence containing large reception room, with small bar, separate dining room, modern electrically equipped kitchen, entrance hall, 3 bedrooms (2 air-conditioned), 2 beautifully tiled bathrooms, maids' quarters, laundry, tastefully furnished in modern contemporary furniture—all in A-1 condition. Gross income—$65,000 B.W.I. and over, or $40,000 Canadian. Price of practice with office and home—$110,000 B.W.I. or $70,000 Canadian. For further particulars contact Mr. Louis E. Kenny, 10b Collens Rd., Maraval, Port-of-Spain, Trinidad, B.W.I.

EXCELLENT UNOPPOSED BUSY GENERAL PRACTICE in rural Manitoba, serving 3500 population; half-hour's drive to lake resort; 6 miles from new ski development. Well-equipped 11-bed hospital in process of further expansion. Spacious office in town; fully-modern home also available. Gross over $20,000. Owner specializing. Reply to Box 573, CMA Journal, 150 St. George St., Toronto 5, Ont.

FOR SALE.—General practice in large Ontario city. Modern office furniture equipment. Owner specializing. Will introduce. Terms can be arranged. Reply to Box 602, CMA Journal, 150 St. George St., Toronto 5, Ont.

FOR SALE.—Well-established general practice in progressive Manitoba village of 1500 serving a large surrounding area. Modern fully-equipped 30-bed hospital. Annual gross above average. Introduction of one or two months available. Owner leaving to specialize July 1, 1960. Ideal for clinic type of practice for two doctors. For further details reply to Box 603, CMA Journal, 150 St. George St., Toronto 5, Ont.

Residencies and Internships

ST. LUKE HOSPITAL, in Montreal, capacity 451 beds, is considering applications for internship or residency in the different services of a general hospital. The institution is approved with full accreditation by the Joint Commission on Accreditation of Hospitals. The Royal College of Physicians and Surgeons of Canada approves for advanced graduate training the following specialties: anæsthesia, general surgery, internal medicine, orthopædic surgery, otolaryngology, pathology, radiology (diagnostic) and radiology (therapeutic). Applicants may address their applications to Dr. H. I. Tetreault, Medical Superintendent.

ASSISTANT RESIDENCY for July 1, 1960 to June 30, 1961 in a large physical medicine and rehabilitation department approved for training by the Royal College of Physicians and Surgeons. Salary $250 per month. Also a senior internship at a salary of $175 per month. Apply: The Superintendent, Sunnybrook Hospital, Department of Veterans' Affairs, Toronto 12, Ont.

WANTED.—Resident physician, preferably with psychiatric experience, for private psychiatric hospital, duties to begin by March 1st, 1960. Living quarters at reasonable cost. Apply to Medical Superintendent. Homewood Sanitarium, Guelph, Ontario.

EXCELLENT OPPORTUNITY EXISTS for general internship as of July 1st, 1960, in new general hospital in Toronto area. Enquiries should be directed to: Administrator, South Peel Hospital, Box 580, Cooksville, Ontario.

VACANCY.—Senior internship in pathology for 6 months. Position available immediately. Assistant residency in pathology for 1 year, available July 1, 1960. Apply: Director of Laboratories, Deer Lodge Hospital, St. James, Manitoba.

MEDICAL NEWS *in brief*

(Continued from page 274)

PRIZES FOR MENTAL DEFICIENCY RESEARCH

The Parent School Organization of the Provincial Training School in Red Deer, Alberta, has inaugurated an annual award of three prizes of $100 each for persons who have done original research in the field of mental deficiency. This research may be concerned primarily with medicine, psychology, genetics, psychiatry, education or eugenics. The work should have been performed within the past 12 months, and manuscripts or reprints of publications will be accepted from professionally qualified people in these various fields. These manuscripts should be submitted in six copies to the Chairman, Research Committee, Parent School Organization for Exceptional Children, Box 580, Red Deer, Alberta, not later than July 31, 1960.

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NEW DEVELOPMENT IN BLOOD PRESERVATION

The pursuit of new ways of keeping blood is constantly progressing. At the present stage of development — with much additional work still to be done—blood in volumes of one pint can be frozen solid in fewer than 45 seconds. This was recently announced by officials of the Linde Company, Division of Union Carbide Corp. With approximately equal rapidity, blood thus frozen can be thawed and brought to body temperature just before being transfused. Present data indicate that blood stored at –320° F. (–196° C.), temperature of liquid nitrogen, may be preserved indefinitely since neither chemical nor physical changes can occur, with the possible exception of those induced by radiation.

The maintenance of frozen cells at such temperature presents an interesting physical phenomenon. In such a state there is not enough energy to support chemical or physical change. Crystal structures, such as ice, cannot form or grow, which is not so at temperatures of 0 or –50° or even –100°. It is well known that ice frozen in a lake or in a refrigerator has crystals that are continuously growing in size. To preserve live blood cells the freezing process must halt the growth of crystals before they get so large as to inflict mechanical damage on the cell. Rapid freezing is also important because as the water in the cells congeals, the normal salt solutions become more and more concentrated until they reach a degree of hypertonicity which can destroy the cell.

The use of liquid nitrogen as a refrigerant was proposed early in this work by several investigators for two principal reasons. One is its ability to accomplish fast freezing to very low temperatures and the other is that it is commonly available at reasonable cost. This will make possible its widespread use as a coolant once blood preservation techniques have been refined.

An important aspect of this kind of work is the analysis of heat transfer rates, since preservation of the specimen requires that every part of it be frozen sufficiently rapidly. The geometry of blood containers to be suitable for the freeze-thaw cycle is therefore very important. The principal object of experimentation with these containers was to determine the maximum thickness of blood that could be successfully frozen and thawed. In the initial experiments, thicknesses no greater than 4 or 5 mm. were used; later this was increased to 17 mm. with complete success and further experimentation has been undertaken with flat containers with thicknesses ranging from 4 to 33 mm. The aim of this project is to devise a single sterile container which can be used to hold new blood as it is being drawn, store it in the frozen state and thaw it to body temperature before use.

Another problem presented by this project is the selection of additives and anticoagulants necessary to long-term preservation of blood. A survival of red cells under these experimental conditions was determined by labelling with radiochromium and it was found that recovery rates were of the order of 85 to 95% and survival rates of 75 to 80%. These figures compare favourably with those found in blood stored by present-day methods for relatively shorter periods of time. "Based on present knowledge," says Dr. R. M. Milton, "we visualize a process in which freezing or thawing can be carried out by hospital technicians and in which the freezing or thawing operation will require considerably less than five minutes per unit of blood."

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HEALTH SERVICES FOR PUBLIC ASSISTANCE RECIPIENTS

The Research and Statistics Division of the Department of National Health and Welfare, Ottawa, has published as No. 1 of their Health Care Series a second edition of "Health Services for Public Assistance Recipients in Canada", which presents in concise fashion certain facts and figures on provincial arrangements for the health care of this group of citizens. Five provinces have formal arrangements for such health care, and these are described in great detail while the description of services in other provinces is necessarily briefer. Under each province, a separate section describes the effect of the new legislation on the provision of hospital care to public assistance patients. The whole brochure is intended to bring up-to-date the first edition which was published in September 1957.

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AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

The next scheduled examinations (Part II), oral and clinical, for all candidates will be conducted at the Edgewater Beach Hotel, Chicago, Illinois, by the entire Board, from April 11 to 16, 1960. Formal notice of the exact time of each candidate's examination will be sent him in advance of the examination dates.

Candidates who participated in the Part I Examinations will be notified of their eligibility for the Part II Examinations as soon as possible.

The deadline date for the receipt of new and reopened applications for the 1961 examinations is August 1, 1960. Candidates are urged to submit their applications as soon as possible before that time, to: Robert L. Faulkner, M.D., 2105 Adelbert Road, Cleveland 6, Ohio.

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MENTAL HEALTH RESEARCH GRANT

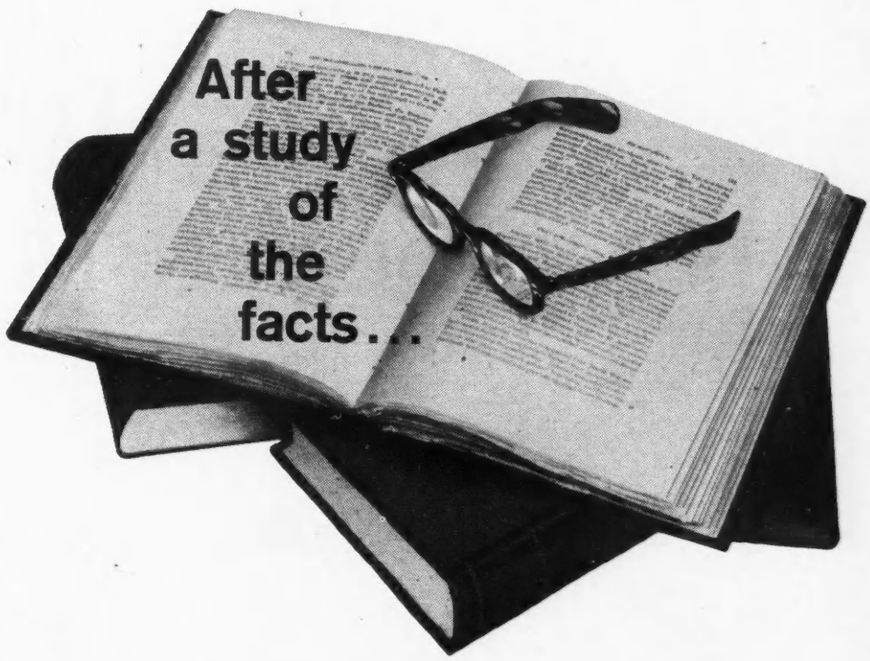
The Rev. Dr. Noël Mailloux, director of the Human Relations Research Centre in Montreal, has been awarded a grant from the National Research Fund of the Canadian Mental Health Association, for study of the personality of delinquent boys, with a view to improving treatment of young people in custody. His work on the delinquent's attitude toward parents, school, work and money, judicial institutions, police and correctional institutions already appears to be of considerable importance. The research grant will make it possible for Dr. Mailloux to devote practically full time to these researches on delinquency during the next four years. Under the terms of the grant he is encouraged to exercise "creative freedom", which means simply that he is free to explore any promising scientific leads as they may develop in the course of his investigations.

Dr. Mailloux has devoted many years to research into human relations. Two years ago he resigned his post as chairman of the department of psychology at the University of Montreal to give almost all his time to the study of the delinquent personality.

HYPOCHOLESTERÆMIC EFFECT OF NICOTINIC ACID

There is now little doubt that oral administration of nicotinic acid is capable of reducing the serum cholesterol level in both normal and hypercholesteræmic subjects and in laboratory animals. The mechanism of its action is obscure however, and experiments by Friedman and his colleagues from San Francisco (*J. Clin. Invest.*, 38: 1328, 1959) do not help to clear up the mystery. They studied the effects of nicotinic acid on cholesterol in the rat and found that it does not affect intestinal absorption of either cholesterol or total lipid, nor does it influence the rate of cholesterol turnover in the liver. Rabbits pair-fed a diet high in cholesterol and fat with and without nicotinic acid showed no significant difference in average plasma cholesterol or degree of aortic atherosclerosis. The authors suggest that the observed effects of nicotinic acid in preventing atherosclerosis and lowering cholesterol levels may be due to an appetite-depressing effect.

(Continued on page 20)



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Effective blood sugar control with chlorpropamide (DIABINESE) in cases of secondary tolbutamide failure has become a familiar clinical experience. Where chlorpropamide has failed, on the other hand, other sulfonylurea therapy has generally proved ineffective.[1]

Doesn't it make good clinical sense, therefore to start with Diabinese?

1. Danowski, T. S.; and Mateer, F. M.: Ann. New York Acad. Sc. 74:971 March 30, 1959.

When other oral therapy has failed...

"Sixty-four per cent of patients who lost responsiveness to tolbutamide were managed satisfactorily with chlorpropamide".[2]

[2]Sugar, S. J. N.; Thomas, L. J., and Tatlier, S.: Ann. New York Acad. Sc. 74:625, 1959.

SUPPLIED: 250 mg. tablets (scored) in bottles of 30 and 100
100 mg. tablets (scored) in bottles of 100

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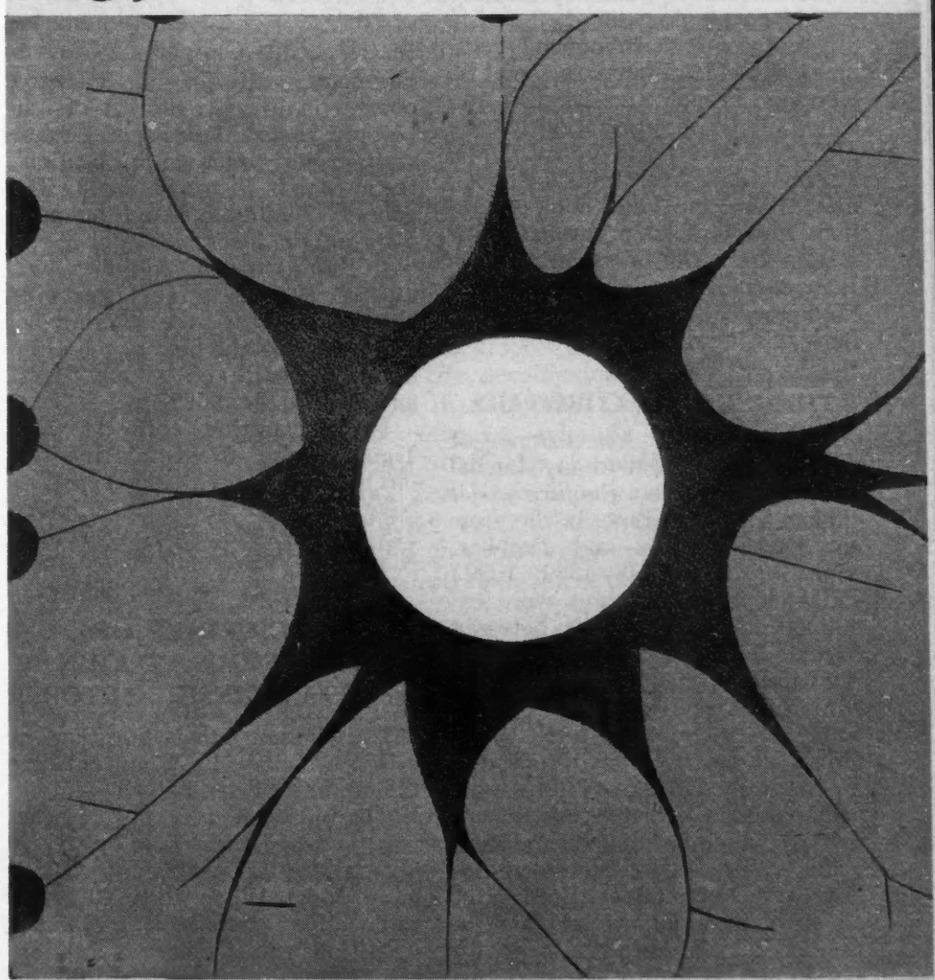

In the treatment of depression Tofrānil has established the remarkable record of producing remission or improvement in approximately 80 per cent of cases.[1-7] Tofrānil is exceptionally safe in usage—is adaptable to either office or hospital practice—is administrable by either oral or intramuscular routes.

Tofrānil—*a potent thymoleptic—not a MAO inhibitor*. *Does* act effectively and safely in *all* types of depression regardless of severity or chronicity. *Does not* inhibit monoamine oxidase in brain or liver; produce CNS stimulation; or potentiate other drugs such as barbiturates and alcohol.

Detailed Literature Available on Request.

Tofrānil (imipramine HCl), tablets of 25 mg, bottles of 100 and 1,000.
Ampuls for intramuscular administration only, each containing 25 mg in 2cc of solution, cartons of 10 and 50.

References:

1. Ayd, F. J. Jr.: Bull. School Med. Univ. Maryland *44*:29, 1959
2. Azima, H., and Vispo, R. H.: A.M.A. Arch. Neurol. & Psychiat. *81*:658, 1959
3. Lehmann, H. E.; Cahn, C. H., and de Verteuil, R. L.: Canad. Psychiat. A. J. *3*:155, 1958
4. Mann, A. M., and MacPherson, A. S.: Canad. Psychiat. A.J. *4*:38, 1959
5. Sloane, R. B.; Habib, A., and Batt, U. E.: Canad. M.A.J. *80*:540, 1959
6. Straker, M.: Canad. M.A.J. *80*:546, 1959
7. Strauss, H.: New York J. Med. *59*:2906, 1959

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MEDICAL NEWS *in brief*

(Continued from page 15)

THE SIXTH INTERNATIONAL CONGRESS OF INTERNAL MEDICINE

The Sixth International Congress of Internal Medicine will be held in Basle, Switzerland, on August 24 to 27, 1960. The President of the International Society of Internal Medicine, which is sponsoring the congress, is Sir Russell Brain of London, and the Canadian representative on the International Committee is Professor R. F. Farquharson of Toronto. The last date for applications to read a paper or present a scientific exhibit will be February 29, 1960, and the last date for enrolment at a normal fee is April 30. The preliminary program includes symposia on the pathogenesis and therapy of œdema, and on enzyme regulations in clinical practice. In addition to a number of individual communications, there will also be panels on serology in rheumatism and on instruction in internal medicine. The official languages will be German, French and English and simultaneous interpretation for the plenary sessions will be available. There will be scientific, technical, medical-historical and book exhibitions and a social program. Information from the Secretariat, Sixth International Congress of Internal Medicine, Steinentorstrasse 13, Basle, Switzerland.

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THE "SILENT" CORONARY

The frequency of occurrence of pain as a symptom in myocardial infarction has been a controversial subject for a long time. In the present study (Stokes and Dawber, *Ann. Int. Med.*, 50: 1359, 1959) serial electrocardiograms were examined in 5209 subjects between 30 and 59 years of age who participated in the epidemiological study of heart disease in Framingham, Massachusetts. Each individual subject was questioned meticulously with respect to thoracic pain and other symptoms of myocardial infarction every two years, and a 12-lead electrocardiogram was obtained at the time of all such examinations and also at the time of all acute illnesses with symptoms suggesting the presence of myocardial infarction.

In the seven-year period between June 1950 and April 1957, 73 subjects developed electrocardiographic signs of acute myocardial infarction, manifested at the time of an acute attack or at the time of the regular biennial examination. In all, during the course of seven years, 20 subjects died suddenly under circumstances that strongly suggested the presence of coronary disease. Of the above-mentioned 73 patients, 15 (i.e. 20%) had attacks clinically unrecognized and eight of the 15 did not admit to any thoracic pain at all.

Although no characteristic clinical pattern of "silent" myocardial infarction was determined, angina pectoris was significantly less frequent after unrecognized infarctions, and only one case was found in which unrecognized infarction involved the lateral wall of the left ventricle.

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COURSE IN THERAPY OF AMBLYOPIA

The Institute of Ophthalmology of the Americas has announced that Dr. Curt Cuppers of Giessen, Germany, will give an intensive course on "The treatment of amblyopia, theory, instrument demonstration and practical application", from March 7 to 18, 1960. The course is limited to 20 ophthalmologists and the fee is $100.

In addition, Dr. Cuppers will give a series of three lectures on "Introduction to the therapy of amblyopia by the help of the afterimage method", on March 21, 22 and 23. The fee is $25.

For registration, apply to: Mrs. Tamar Weber, Registrar, Institute of Ophthalmology of the Americas, New York Eye and Ear Infirmary, 218 Second Avenue, New York 3, N.Y.

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HEPATIC UPTAKE OF INTRAVENOUS VITAMIN B_{12} PLUS INTRINSIC FACTOR

The finding that addition of intrinsic factor (I.F.) can enhance the uptake of radioactive vitamin B_{12} by slices of liver and of other tissues was studied *in vivo* by Okuda, Wider and Chow (Baltimore, Md.). When given 40 μg. of radioactive vitamin B_{12} together with intrinsic factor preparation, rats showed a greatly increased hepatic uptake with concomitant decrease in radioactivity in other tissues, as compared with controls (*J. Lab. & Clin. Med.*, 54: 535, 1959).

In other experiments they demonstrated that the intravenous route was preferable to intramuscular or intraperitoneal administration.

A series of tests designed to explore the reason for the enhanced uptake by the liver of the I.F. concentrate with B_{12} produced results which suggest formation of a complex of I.F. concentrate and B_{12} for which the liver has a preferential access *in vivo*. Furthermore, the authors could not find any evidence of the presence of receptor proteins in various tissues reported by other workers, as the preferential uptake of B_{12} plus I.F. concentrate *in vivo* seemed to be limited to the liver. To a lesser extent an enhanced uptake by the liver of the complex preparation of B_{12} with an extract of rat stomach mucosa, hog gall-bladder bile, and human saliva and gastric juice was demonstrated. It is not possible to explain the observed phenomena satisfactorily at present.

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LONG-TERM ANTICOAGULANT TREATMENT

The hæmorrhagic complications of phenindione therapy in 217 patients treated for periods up to three years are analyzed by Fuller (*Lancet*, 2: 489, 1959). There were altogether 194 bleeding episodes in 105 patients: 24 severe, 31 moderate and 139 mild. During the first three months of anticoagulant therapy, one in three patients had some episode of bleeding, after which the incidence was reduced to one in six. There were two, possibly three, deaths and of the remaining patients with severe hæmorrhage eight had hæmatemesis with melæna, seven had hæmaturia, two epistaxis, one extensive bruising and one a retroperitoneal hæmatoma.

The author suggests the use by the patients of the ortholidine test for occult hæmaturia. Its routine use would protect the patients to some extent, although it would not eliminate the danger of bleeding from other organs. Anticoagulant therapy is best reserved for intelligent patients who can be expected to understand the dangers involved in this treatment and to recognize bleeding at the earliest possible moment.